Matematička logika i skupovi

Matematika za ekonomiste 1

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Sadržaj

prvi zadatak

Matematička logika

Zadatak 1

Odredite istinitost sljedećih izjava:

a) $3x - 5$ *je parni broj.*

b) *Broj* 2 *nije prosti broj.*

c) $(3 < 2) \wedge (2 > 1)$

d) *Ako je* 4 *neparni broj, tada je* 3 *parni broj.*

e) $\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20)$

Rješenje

a) $3x - 5$ *je parni broj.*

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Ova izjava nije sud pa ne možemo odrediti njezinu istinitost.

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c) $(3 < 2) \wedge (2 > 1)$

Konjunkcija

a	b	$a \wedge b$
1	1	1
1	0	0
0	1	0
0	0	0

Rješenje

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c) $(3 < 2) \wedge (2 > 1) \rightsquigarrow$

Konjunkcija

a	b	$a \wedge b$
1	1	1
1	0	0
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Rješenje

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c) $(3 < 2) \land (2 > 1) \rightsquigarrow 0$

Konjunkcija

a	b	$a \land b$
1	1	1
1	0	0
0	1	0
0	0	0

Rješenje

a) $3x - 5$ *je parni broj.*

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1	1	1
1	0	0
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Konjunkcija

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1	1	1
1	0	0
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Konjunkcija

a	b	$a \wedge b$
1	1	1
1	0	0
0	1	0
0	0	0

c) $(3 < 2) \wedge (2 > 1) \rightsquigarrow 0 \wedge 1 = 0$

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d) *Ako je* 4 *neparni broj, tada je* 3 *parni broj.*

Konjunkcija

a	b	$a \wedge b$
1	1	1
1	0	0
0	1	0
0	0	0

Rješenje

Konjunkcija

a	b	$a \wedge b$
1	1	1
1	0	0
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$\text{4 je neparni broj} \;\Rightarrow\; \text{3 je parni broj}$

Rješenje

Konjunkcija

a	b	$a \wedge b$
1	1	1
1	0	0
0	1	0
0	0	0

Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
0	1	1
0	0	1

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4 je neparni broj $\Rightarrow$ 3 je parni broj $\rightsquigarrow$

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a	b	$a \land b$
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1	0	0
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0	0	0

Implikacija

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a	b	$a \wedge b$
1	1	1
1	0	0
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0	0	0

Implikacija

a	b	$a \Rightarrow b$
1	1	1
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Rješenje

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1	1	1
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Konjunkcija

a	b	$a \wedge b$
1	1	1
1	0	0
0	1	0
0	0	0

Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
0	1	1
0	0	1

c) $(3 < 2) \wedge (2 > 1) \rightsquigarrow 0 \wedge 1 \ = \ 0$

Ova izjava je lažni sud.

d) *Ako je* 4 *neparni broj, tada je* 3 *parni broj.*

4 je neparni broj $\ \Rightarrow\ $ 3 je parni broj $\rightsquigarrow 0 \Rightarrow 0$

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Konjunkcija

a	b	$a \wedge b$
1	1	1
1	0	0
0	1	0
0	0	0

Implikacija

a	b	$a \Rightarrow b$
1	1	1
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Ova izjava je lažni sud.

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4 je neparni broj $\Rightarrow$ 3 je parni broj $\rightsquigarrow 0 \Rightarrow 0 \;=\; 1$

Ova izjava je istinit sud.

Konjunkcija

a	b	$a \wedge b$
1	1	1
1	0	0
0	1	0
0	0	0

Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
0	1	1
0	0	1

e) $\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20)$

Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
0	1	1
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Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
0	1	1
0	0	1

Disjunkcija

a	b	$a \vee b$
1	1	1
1	0	1
0	1	1
0	0	0

e) $\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20)$

$($

Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
0	1	1
0	0	1

Disjunkcija

a	b	$a \vee b$
1	1	1
1	0	1
0	1	1
0	0	0

e) $\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20)$

$(0$

Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
0	1	1
0	0	1

Disjunkcija

a	b	$a \vee b$
1	1	1
1	0	1
0	1	1
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$(0 \vee$

Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
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0	0	1

Disjunkcija

a	b	$a \vee b$
1	1	1
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0	1	1
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$(0 \vee 1$

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a	b	$a \Rightarrow b$
1	1	1
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a	b	$a \vee b$
1	1	1
1	0	1
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$(0 \vee 1)$

Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
0	1	1
0	0	1

Disjunkcija

a	b	$a \vee b$
1	1	1
1	0	1
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0	0	0

e) $\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20)$

$(0 \vee 1) \Rightarrow$

Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
0	1	1
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Disjunkcija

a	b	$a \vee b$
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1	0	1
0	1	1
0	0	0

e) $\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20)$

$(0 \vee 1) \Rightarrow 0$

Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
0	1	1
0	0	1

Disjunkcija

a	b	$a \vee b$
1	1	1
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e) $\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20)$

$(0 \vee 1) \Rightarrow 0 \;\; =$

Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
0	1	1
0	0	1

Disjunkcija

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$(0 \vee 1) \Rightarrow 0 \ = \ 1$

Implikacija

a	b	$a \Rightarrow b$
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1	1	1
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0	1	1
0	0	0

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$(0 \vee 1) \Rightarrow 0 \;=\; 1 \Rightarrow$

Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
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0	0	1

Disjunkcija

a	b	$a \vee b$
1	1	1
1	0	1
0	1	1
0	0	0

e) $\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20)$

$(0 \vee 1) \Rightarrow 0 \ = \ 1 \Rightarrow 0$

Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
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Disjunkcija

a	b	$a \vee b$
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e) $\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20)$

$(0 \vee 1) \Rightarrow 0 \ = \ 1 \Rightarrow 0 \ =$

Implikacija

a	b	$a \Rightarrow b$
1	1	1
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Disjunkcija

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1	1	1
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e) $\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20)$

$$(0 \vee 1) \Rightarrow 0 \;=\; 1 \Rightarrow 0 \;=\; 0$$

Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
0	1	1
0	0	1

Disjunkcija

a	b	$a \vee b$
1	1	1
1	0	1
0	1	1
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e) $\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20)$

$$(0 \vee 1) \Rightarrow 0 \ = \ 1 \Rightarrow 0 \ = \ 0$$

Ova izjava je lažni sud.

Implikacija

a	b	$a \Rightarrow b$
1	1	1
1	0	0
0	1	1
0	0	1

Disjunkcija

a	b	$a \vee b$
1	1	1
1	0	1
0	1	1
0	0	0

drugi zadatak

Zadatak 2

Negirajte implikaciju

$$\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20).$$

$$a \Rightarrow b \;=\; \overline{a} \vee b$$

Zadatak 2

Negirajte implikaciju

$$\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20).$$

$$a \Rightarrow b \;=\; \overline{a} \vee b$$

De Morganovi zakoni

$$\overline{a \vee b} \;=\; \overline{a} \wedge \overline{b}$$

$$\overline{a \wedge b} \;=\; \overline{a} \vee \overline{b}$$

Zadatak 2

Negirajte implikaciju

$$\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20).$$

$$a \Rightarrow b \;=\; \overline{a} \vee b$$

$$\overline{a \Rightarrow b} \;=\; a \wedge \overline{b}$$

De Morganovi zakoni

$$\overline{a \vee b} \;=\; \overline{a} \wedge \overline{b}$$

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Zadatak 2

Negirajte implikaciju

$$\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20).$$

$$a \Rightarrow b \;=\; \overline{a} \vee b$$

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De Morganovi zakoni

$$\overline{a \vee b} \;=\; \overline{a} \wedge \overline{b}$$

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Zadatak 2

Negirajte implikaciju

$$\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \Rightarrow (5^2 = 20).$$

Rješenje

Negacija implikacije

$$a \Rightarrow b \ = \ \overline{a} \vee b$$

$$\overline{a \Rightarrow b} \ = \ a \wedge \overline{b}$$

De Morganovi zakoni

$$\overline{a \vee b} \ = \ \overline{a} \wedge \overline{b}$$

$$\overline{a \wedge b} \ = \ \overline{a} \vee \overline{b}$$

Zadatak 2

Negirajte implikaciju

$$\underset{a}{\boxed{\left((\pi \in \mathbb{Q}) \vee (5^2 = 25)\right)}} \Rightarrow (5^2 = 20).$$

Rješenje

Negacija implikacije

$$a \Rightarrow b \ = \ \bar{a} \vee b$$

$$\overline{a \Rightarrow b} \ = \ a \wedge \bar{b}$$

De Morganovi zakoni

$$\overline{a \vee b} \ = \ \bar{a} \wedge \bar{b}$$

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Zadatak 2

Negirajte implikaciju

$$\underset{a}{\boxed{\left((\pi \in \mathbb{Q}) \vee (5^2 = 25)\right)}} \Rightarrow \underset{b}{\boxed{(5^2 = 20)}}.$$

Rješenje

Negacija implikacije

$$a \Rightarrow b \;=\; \bar{a} \vee b$$

$$\overline{a \Rightarrow b} \;=\; a \wedge \bar{b}$$

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$$\overline{a \vee b} \;=\; \bar{a} \wedge \bar{b}$$

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Zadatak 2

Negirajte implikaciju

$$\underset{a}{\boxed{\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big)}} \Rightarrow \underset{b}{\boxed{(5^2 = 20)}}.$$

Rješenje

Negacija implikacije

$$\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big)$$

$$a \Rightarrow b \;=\; \bar{a} \vee b$$

$$\overline{a \Rightarrow b} \;=\; a \wedge \overline{b}$$

De Morganovi zakoni

$$\overline{a \vee b} \;=\; \bar{a} \wedge \overline{b}$$

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$$\underset{a}{\boxed{\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big)}} \Rightarrow \underset{b}{\boxed{(5^2 = 20)}}.$$

Rješenje

Negacija implikacije

$$\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \wedge$$

$$a \Rightarrow b \;=\; \overline{a} \vee b$$

$$\overline{a \Rightarrow b} \;=\; a \wedge \overline{b}$$

De Morganovi zakoni

$$\overline{a \vee b} \;=\; \overline{a} \wedge \overline{b}$$

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Zadatak 2

Negirajte implikaciju

$$\underset{a}{\boxed{\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big)}} \Rightarrow \underset{b}{\boxed{(5^2 = 20)}}.$$

Rješenje

Negacija implikacije

$$\big((\pi \in \mathbb{Q}) \vee (5^2 = 25)\big) \wedge (5^2 \neq 20)$$

treći zadatak

Zadatak 3

Zadan je predikat $P(x, y) =$ “$x + y = 0$”. *Ispitajte istinitost sljedećih sudova u univerzumima razmatranja* $\mathcal{U}_1 = \mathbb{Z}$ *i* $\mathcal{U}_2 = \mathbb{N}$.

a) $\forall x \forall y \, P(x, y)$

b) $\forall x \exists y \, P(x, y)$

c) $\exists y \forall x \, P(x, y)$

d) $\exists x \exists y \, P(x, y)$

e) $\forall x \exists ! y \, P(x, y)$

f) $\forall x \forall y \, \neg P(x, y)$

Rješenje

$$\boxed{P(x, y) = \text{“}x + y = 0\text{”}}$$

a) $\forall x \forall y \, P(x, y)$

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Rješenje

$P(x, y) = \text{“}x + y = 0\text{”}$

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Suma svaka dva cijela broja jednaka je nula.

Rješenje

$P(x, y) = \text{“}x + y = 0\text{”}$

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Suma svaka dva cijela broja jednaka je nula.

Sud $\forall x \forall y\, P(x, y)$ je lažni sud.

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Sud $\forall x \forall y \, P(x, y)$ je lažni sud. Na primjer, suma cijelih brojeva 5 i -3 je različita od nula.

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Predikat $P(x,y)$ ne vrijedi u $\mathbb{Z}$.

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Predikat $P(x,y)$ ne vrijedi u $\mathbb{Z}$.

$\boxed{\mathcal{U}_2 = \mathbb{N}}$

Rješenje

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Suma svaka dva prirodna broja jednaka je nula.

Rješenje

$P(x,y) = \text{“}x + y = 0\text{”}$

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Predikat $P(x,y)$ ne vrijedi u $\mathbb{N}$.

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Postoji cijeli broj y koji u sumi sa svakim cijelim brojem x daje nulu.

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d) $\exists x \exists y\, P(x, y)$

$\mathcal{U}_1 = \mathbb{Z}$

Postoje dva cijela broja čija suma je jednaka nula.

$P(x, y) =$ "$x + y = 0$"

d) $\exists x \exists y\, P(x, y)$

$\mathcal{U}_1 = \mathbb{Z}$

Postoje dva cijela broja čija suma je jednaka nula.

Sud $\exists x \exists y\, P(x, y)$ je istinit sud.

$P(x, y) =$ "$x + y = 0$"

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$\mathcal{U}_1 = \mathbb{Z}$

Postoje dva cijela broja čija suma je jednaka nula.

Sud $\exists x \exists y\, P(x, y)$ je istinit sud. Na primjer, suma cijelih brojeva 4 i -4 je jednaka nula.

$P(x,y) =$ "$x + y = 0$"

d) $\exists x \exists y\, P(x,y)$

$\mathcal{U}_1 = \mathbb{Z}$

Postoje dva cijela broja čija suma je jednaka nula.

Sud $\exists x \exists y\, P(x,y)$ je istinit sud. Na primjer, suma cijelih brojeva 4 i -4 je jednaka nula.

Predikat $P(x,y)$ je zadovoljiv u $\mathbb{Z}$.

$P(x,y) = \text{“}x + y = 0\text{”}$

d) $\exists x \exists y\, P(x,y)$

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Sud $\exists x \exists y\, P(x, y)$ je lažni sud jer je suma prirodnih brojeva uvijek strogo veća od nule.

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Predikat $P(x, y)$ je zadovoljiv u $\mathbb{Z}$.

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Sud $\exists x \exists y\, P(x, y)$ je lažni sud jer je suma prirodnih brojeva uvijek strogo veća od nule.

Predikat $P(x, y)$ nije zadovoljiv u $\mathbb{N}$.

$P(x, y) = \text{“}x + y = 0\text{”}$

e) $\forall x \exists ! y \, P(x, y)$

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Za svaki cijeli broj x postoji jedinstveni cijeli broj y takav da je njihova suma jednaka nula.

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Za svaki cijeli broj x postoji jedinstveni cijeli broj y takav da je njihova suma jednaka nula.

Sud $\forall x \exists! y\, P(x, y)$ je istinit sud.

$P(x, y) = \text{“}x + y = 0\text{”}$

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Za svaki cijeli broj x postoji jedinstveni cijeli broj y takav da je njihova suma jednaka nula.

Sud $\forall x \exists ! y \, P(x, y)$ je istinit sud. Naime, cijeli broj x jedino sa svojim suprotnim brojem $-x$ daje u sumi nulu.

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Suma svaka dva cijela broja je različita od nula.

$P(x, y) = \text{“}x + y = 0\text{”}$

f) $\forall x \forall y \, \neg P(x, y)$

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Suma svaka dva cijela broja je različita od nula.

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Suma svaka dva cijela broja je različita od nula.

Sud $\forall x \forall y \, \neg P(x,y)$ je lažni sud. Na primjer, suma cijelih brojeva 2 i -2 je jednaka nula.

$P(x, y) = \text{“}x + y = 0\text{”}$

f) $\forall x \forall y\, \neg P(x, y)$

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$\boxed{\mathcal{U}_1 = \mathbb{Z}}$

Suma svaka dva cijela broja je različita od nula.

Sud $\forall x \forall y\, \neg P(x, y)$ je lažni sud. Na primjer, suma cijelih brojeva 2 i -2 je jednaka nula.

Predikat $\neg P(x, y)$ ne vrijedi u $\mathbb{Z}$.

$P(x, y) = \text{“}x + y = 0\text{”}$

$\neg P(x, y) = \text{“}x + y \neq 0\text{”}$

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Suma svaka dva cijela broja je različita od nula.

Sud $\forall x \forall y\, \neg P(x, y)$ je lažni sud. Na primjer, suma cijelih brojeva 2 i -2 je jednaka nula.

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$\mathcal{U}_2 = \mathbb{N}$

$$\boxed{P(x,y) = \text{“}x+y=0\text{”}}$$

f) $\forall x \forall y \, \neg P(x,y)$

$$\boxed{\neg P(x,y) = \text{“}x+y\neq 0\text{”}}$$

$$\boxed{\mathcal{U}_1 = \mathbb{Z}}$$

Suma svaka dva cijela broja je različita od nula.

Sud $\forall x \forall y \, \neg P(x,y)$ je lažni sud. Na primjer, suma cijelih brojeva 2 i -2 je jednaka nula.

Predikat $\neg P(x,y)$ ne vrijedi u $\mathbb{Z}$.

$$\boxed{\mathcal{U}_2 = \mathbb{N}}$$

Suma svaka dva prirodna broja je različita od nula.

$P(x, y) =$ "$x + y = 0$"

f) $\forall x \forall y \, \neg P(x, y)$

$\neg P(x, y) =$ "$x + y \neq 0$"

$\mathcal{U}_1 = \mathbb{Z}$

Suma svaka dva cijela broja je različita od nula.

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Predikat $\neg P(x, y)$ ne vrijedi u $\mathbb{Z}$.

$\mathcal{U}_2 = \mathbb{N}$

Suma svaka dva prirodna broja je različita od nula.

Sud $\forall x \forall y \, \neg P(x, y)$ je istinit sud

$P(x, y) = \text{“}x + y = 0\text{”}$

$\neg P(x, y) = \text{“}x + y \neq 0\text{”}$

f) $\forall x \forall y \, \neg P(x, y)$

$\mathcal{U}_1 = \mathbb{Z}$

Suma svaka dva cijela broja je različita od nula.

Sud $\forall x \forall y \, \neg P(x, y)$ je lažni sud. Na primjer, suma cijelih brojeva 2 i -2 je jednaka nula.

Predikat $\neg P(x, y)$ ne vrijedi u $\mathbb{Z}$.

$\mathcal{U}_2 = \mathbb{N}$

Suma svaka dva prirodna broja je različita od nula.

Sud $\forall x \forall y \, \neg P(x, y)$ je istinit sud jer je suma prirodnih brojeva uvijek strogo veća od nule.

$P(x, y) = \text{“}x + y = 0\text{”}$

$\neg P(x, y) = \text{“}x + y \neq 0\text{”}$

f) $\forall x \forall y \, \neg P(x, y)$

$\mathcal{U}_1 = \mathbb{Z}$

Suma svaka dva cijela broja je različita od nula.

Sud $\forall x \forall y \, \neg P(x, y)$ je lažni sud. Na primjer, suma cijelih brojeva 2 i -2 je jednaka nula.

Predikat $\neg P(x, y)$ ne vrijedi u $\mathbb{Z}$.

$\mathcal{U}_2 = \mathbb{N}$

Suma svaka dva prirodna broja je različita od nula.

Sud $\forall x \forall y \, \neg P(x, y)$ je istinit sud jer je suma prirodnih brojeva uvijek strogo veća od nule.

Predikat $\neg P(x, y)$ vrijedi u $\mathbb{N}$.

četvrti zadatak

Zadatak 4

Negirajte sljedeće tvrdnje i ispitajte njihovu istinitost u univerzumu razmatranja $\mathbb{N}$:

a) $\forall n \exists k \, (n = 2k + 1)$

b) $\exists n \, (n > 5)$

c) $\forall n \, (n \text{ je djeljiv s } 3)$

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

a) $\forall n \exists k \, (n = 2k + 1)$

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

a) $\forall n \exists k \, (n = 2k + 1)$

Svi prirodni brojevi su neparni.

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

a) $\forall n \exists k \, (n = 2k + 1) \leftsquigarrow$ lažna tvrdnja

Svi prirodni brojevi su neparni.

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

a) $\forall n \exists k \, (n = 2k + 1) \leftsquigarrow$ lažna tvrdnja

Svi prirodni brojevi su neparni.

Negacija tvrdnje

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

$$\begin{aligned} \neg\,\forall x\, P(x) &= \exists x\, \neg P(x) \\ \neg\,\exists x\, P(x) &= \forall x\, \neg P(x) \end{aligned}$$

a) $\forall n \exists k\,(n = 2k + 1) \leftsquigarrow$ lažna tvrdnja

Svi prirodni brojevi su neparni.

Negacija tvrdnje

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

$$\neg \forall x\, P(x) \;=\; \exists x\, \neg P(x)$$

$$\neg \exists x\, P(x) \;=\; \forall x\, \neg P(x)$$

a) $\forall n \exists k\, (n = 2k + 1) \leftsquigarrow$ lažna tvrdnja

Svi prirodni brojevi su neparni.

Negacija tvrdnje $\exists n$

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

$$\neg \forall x \, P(x) \; = \; \exists x \, \neg P(x)$$

$$\neg \exists x \, P(x) \; = \; \forall x \, \neg P(x)$$

a) $\forall n \exists k \, (n = 2k + 1) \leftsquigarrow$ lažna tvrdnja

Svi prirodni brojevi su neparni.

Negacija tvrdnje $\quad \exists n \forall k$

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

$$\neg\,\forall x\, P(x) \;=\; \exists x\, \neg P(x)$$
$$\neg\,\exists x\, P(x) \;=\; \forall x\, \neg P(x)$$

a) $\forall n \exists k\, (n = 2k + 1) \leftarrow$ lažna tvrdnja

Svi prirodni brojevi su neparni.

Negacija tvrdnje $\exists n \forall k\, (n \neq 2k + 1)$

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

$$\neg\, \forall x\, P(x) \;=\; \exists x\, \neg P(x)$$
$$\neg\, \exists x\, P(x) \;=\; \forall x\, \neg P(x)$$

a) $\forall n \exists k\, (n = 2k + 1) \leftarrow\!\!\!\sim\!\!\sim$ lažna tvrdnja

Svi prirodni brojevi su neparni.

$\boxed{\text{Negacija tvrdnje}}$ $\exists n \forall k\, (n \neq 2k + 1)$

b) $\exists n\, (n > 5)$

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

$\neg \forall x\, P(x) \;=\; \exists x \neg P(x)$

$\neg \exists x\, P(x) \;=\; \forall x \neg P(x)$

a) $\forall n \exists k \,(n = 2k + 1) \leftarrow$ lažna tvrdnja

Svi prirodni brojevi su neparni.

Negacija tvrdnje $\quad \exists n \forall k \,(n \neq 2k + 1)$

b) $\exists n \,(n > 5)$

Postoji prirodni broj koji je veći od 5.

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

$$\neg\,\forall x\, P(x) \;=\; \exists x\,\neg P(x)$$

$$\neg\,\exists x\, P(x) \;=\; \forall x\,\neg P(x)$$

a) $\forall n \exists k\,(n = 2k+1)$ ⇜ lažna tvrdnja

Svi prirodni brojevi su neparni.

Negacija tvrdnje $\quad \exists n \forall k\,(n \neq 2k+1)$

b) $\exists n\,(n > 5)$ ⇜ istinita tvrdnja

Postoji prirodni broj koji je veći od 5.

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

$$\neg\,\forall x\, P(x) \;=\; \exists x\,\neg P(x)$$

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a) $\forall n \exists k\,(n = 2k+1) \leftsquigarrow$ lažna tvrdnja

Svi prirodni brojevi su neparni.

Negacija tvrdnje $\quad \exists n \forall k\,(n \neq 2k+1)$

b) $\exists n\,(n > 5) \leftsquigarrow$ istinita tvrdnja

Postoji prirodni broj koji je veći od 5.

Negacija tvrdnje $\quad \forall n$

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

$$\neg\,\forall x\, P(x) \;=\; \exists x\, \neg P(x)$$

$$\neg\,\exists x\, P(x) \;=\; \forall x\, \neg P(x)$$

a) $\forall n \exists k\, (n = 2k + 1) \leftsquigarrow$ lažna tvrdnja

Svi prirodni brojevi su neparni.

$\boxed{\text{Negacija tvrdnje}}$ $\quad \exists n \forall k\, (n \neq 2k + 1)$

b) $\exists n\, (n > 5) \leftsquigarrow$ istinita tvrdnja

Postoji prirodni broj koji je veći od 5.

$\boxed{\text{Negacija tvrdnje}}$ $\quad \forall n\, (n \leqslant 5)$

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

$$\neg \forall x\, P(x) \;=\; \exists x \neg P(x)$$
$$\neg \exists x\, P(x) \;=\; \forall x \neg P(x)$$

a) $\forall n \exists k\, (n = 2k + 1)$ $\leftsquigarrow$ lažna tvrdnja

Svi prirodni brojevi su neparni.

Negacija tvrdnje $\quad \exists n \forall k\, (n \neq 2k + 1)$

b) $\exists n\, (n > 5)$ $\leftsquigarrow$ istinita tvrdnja

Postoji prirodni broj koji je veći od 5.

Negacija tvrdnje $\quad \forall n\, (n \leqslant 5)$

c) $\forall n\, (n$ je djeljiv s $3)$

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

$$\neg\,\forall x\, P(x) \;=\; \exists x\,\neg P(x)$$
$$\neg\,\exists x\, P(x) \;=\; \forall x\,\neg P(x)$$

a) $\forall n \exists k\,(n = 2k + 1)$ $\leftsquigarrow$ lažna tvrdnja

Svi prirodni brojevi su neparni.

Negacija tvrdnje $\quad \exists n \forall k\,(n \neq 2k + 1)$

b) $\exists n\,(n > 5)$ $\leftsquigarrow$ istinita tvrdnja

Postoji prirodni broj koji je veći od 5.

Negacija tvrdnje $\quad \forall n\,(n \leqslant 5)$

c) $\forall n\,(n$ je djeljiv s $3)$

Svaki prirodni broj je djeljiv s 3.

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

$$\neg\,\forall x\, P(x) \;=\; \exists x\, \neg P(x)$$
$$\neg\,\exists x\, P(x) \;=\; \forall x\, \neg P(x)$$

a) $\forall n \exists k\, (n = 2k + 1) \leftsquigarrow$ lažna tvrdnja

Svi prirodni brojevi su neparni.

Negacija tvrdnje $\quad \exists n \forall k\, (n \neq 2k + 1)$

b) $\exists n\, (n > 5) \leftsquigarrow$ istinita tvrdnja

Postoji prirodni broj koji je veći od 5.

Negacija tvrdnje $\quad \forall n\, (n \leqslant 5)$

c) $\forall n\, (n \text{ je djeljiv s } 3) \leftsquigarrow$ lažna tvrdnja

Svaki prirodni broj je djeljiv s 3.

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

$$\neg\,\forall x\, P(x) \;=\; \exists x\,\neg P(x)$$
$$\neg\,\exists x\, P(x) \;=\; \forall x\,\neg P(x)$$

a) $\forall n \exists k\,(n = 2k + 1) \leftsquigarrow$ lažna tvrdnja

Svi prirodni brojevi su neparni.

Negacija tvrdnje $\quad \exists n \forall k\,(n \neq 2k + 1)$

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Postoji prirodni broj koji je veći od 5.

Negacija tvrdnje $\quad \forall n\,(n \leqslant 5)$

c) $\forall n\,(n$ je djeljiv s $3) \leftsquigarrow$ lažna tvrdnja

Svaki prirodni broj je djeljiv s 3.

Negacija tvrdnje

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

$$\neg \forall x\, P(x) \;=\; \exists x \neg P(x)$$
$$\neg \exists x\, P(x) \;=\; \forall x \neg P(x)$$

a) $\forall n \exists k\, (n = 2k + 1)$ ⇜ lažna tvrdnja

Svi prirodni brojevi su neparni.

Negacija tvrdnje $\exists n \forall k\, (n \neq 2k + 1)$

b) $\exists n\, (n > 5)$ ⇜ istinita tvrdnja

Postoji prirodni broj koji je veći od 5.

Negacija tvrdnje $\forall n\, (n \leqslant 5)$

c) $\forall n\, (n$ je djeljiv s $3)$ ⇜ lažna tvrdnja

Svaki prirodni broj je djeljiv s 3.

Negacija tvrdnje $\exists n$

Rješenje

$\boxed{\mathcal{U} = \mathbb{N}}$

$$\neg \forall x \, P(x) \; = \; \exists x \, \neg P(x)$$
$$\neg \exists x \, P(x) \; = \; \forall x \, \neg P(x)$$

a) $\forall n \exists k \, (n = 2k + 1) \leftsquigarrow$ lažna tvrdnja

Svi prirodni brojevi su neparni.

Negacija tvrdnje $\quad \exists n \forall k \, (n \neq 2k + 1)$

b) $\exists n \, (n > 5) \leftsquigarrow$ istinita tvrdnja

Postoji prirodni broj koji je veći od 5.

Negacija tvrdnje $\quad \forall n \, (n \leqslant 5)$

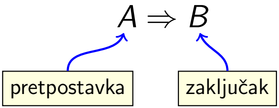
c) $\forall n \, (n$ je djeljiv s $3) \leftsquigarrow$ lažna tvrdnja

Svaki prirodni broj je djeljiv s 3.

Negacija tvrdnje $\quad \exists n \, (n$ nije djeljiv s $3)$

Tvrdnje u matematici

Tvrdnje u matematici



$A \Rightarrow B$

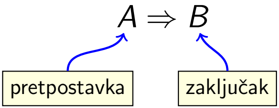
pretpostavka

zaključak

- A je dovoljan uvjet za B
- B je nužan uvjet za A

A	B	$A \Rightarrow B$
1	1	1
1	0	0
0	1	1
0	0	1

Tvrdnje u matematici



$A \Rightarrow B$

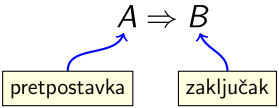
pretpostavka

zaključak

A	B	$A \Rightarrow B$
1	1	1
1	0	0
0	1	1
0	0	1

- A je dovoljan uvjet za B
- B je nužan uvjet za A
- Ukoliko postoji slučaj kod kojeg istinita pretpostavka vodi do lažnog zaključka, tvrdnja ne vrijedi.

Tvrdnje u matematici



$A \Rightarrow B$

pretpostavka

zaključak

- A je dovoljan uvjet za B
- B je nužan uvjet za A

A	B	$A \Rightarrow B$
1	1	1
1	0	0
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0	0	1

- Ukoliko postoji slučaj kod kojeg istinita pretpostavka vodi do lažnog zaključka, tvrdnja ne vrijedi.

TVRDNJA: $A \Rightarrow B$
OBRAT TVRDNJE: $B \Rightarrow A$
SUPROTNA TVRDNJA: $\overline{A} \Rightarrow \overline{B}$
KONTRAPOZICIJA: $\overline{B} \Rightarrow \overline{A}$

Primjer 1

Tvrdnja

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

Primjer 1

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

Primjer 1

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

$$A =$$

Primjer 1

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

$$A = \text{“prirodni broj završava s parnom znamenkom”}$$

Primjer 1

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

$$\begin{aligned} A &= \text{“prirodni broj završava s parnom znamenkom”} \\ B &= \end{aligned}$$

Primjer 1

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

$$\begin{aligned} A &= \text{“prirodni broj završava s parnom znamenkom”} \\ B &= \text{“prirodni broj je djeljiv s 2”} \end{aligned}$$

Primjer 1

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

$$\begin{aligned} A &= \text{“prirodni broj završava s parnom znamenkom”} \\ B &= \text{“prirodni broj je djeljiv s 2”} \\ \overline{A} &= \end{aligned}$$

Primjer 1

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

$$\begin{aligned} A &= \text{“prirodni broj završava s parnom znamenkom”} \\ B &= \text{“prirodni broj je djeljiv s 2”} \\ \overline{A} &= \text{“prirodni broj završava s neparnom znamenkom”} \end{aligned}$$

Primjer 1

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

$$\begin{aligned} A &= \text{“prirodni broj završava s parnom znamenkom”} \\ B &= \text{“prirodni broj je djeljiv s 2”} \\ \overline{A} &= \text{“prirodni broj završava s neparnom znamenkom”} \\ \overline{B} &= \end{aligned}$$

Primjer 1

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

$$\begin{aligned} A &= \text{“prirodni broj završava s parnom znamenkom”} \\ B &= \text{“prirodni broj je djeljiv s 2”} \\ \overline{A} &= \text{“prirodni broj završava s neparnom znamenkom”} \\ \overline{B} &= \text{“prirodni broj nije djeljiv s 2”} \end{aligned}$$

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

Obrat tvrdnje $B \Rightarrow A$

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

Obrat tvrdnje $B \Rightarrow A$

Ako je prirodni broj djeljiv s 2, tada on završava s parnom znamenkom.

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

Obrat tvrdnje $B \Rightarrow A$

Ako je prirodni broj djeljiv s 2, tada on završava s parnom znamenkom.

Suprotna tvrdnja $\overline{A} \Rightarrow \overline{B}$

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

Obrat tvrdnje $B \Rightarrow A$

Ako je prirodni broj djeljiv s 2, tada on završava s parnom znamenkom.

Suprotna tvrdnja $\overline{A} \Rightarrow \overline{B}$

Ako prirodni broj završava s neparnom znamenkom, tada on nije djeljiv s 2.

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

Obrat tvrdnje $B \Rightarrow A$

Ako je prirodni broj djeljiv s 2, tada on završava s parnom znamenkom.

Suprotna tvrdnja $\overline{A} \Rightarrow \overline{B}$

Ako prirodni broj završava s neparnom znamenkom, tada on nije djeljiv s 2.

Kontrapozicija $\overline{B} \Rightarrow \overline{A}$

Tvrdnja $A \Rightarrow B$

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

Obrat tvrdnje $B \Rightarrow A$

Ako je prirodni broj djeljiv s 2, tada on završava s parnom znamenkom.

Suprotna tvrdnja $\overline{A} \Rightarrow \overline{B}$

Ako prirodni broj završava s neparnom znamenkom, tada on nije djeljiv s 2.

Kontrapozicija $\overline{B} \Rightarrow \overline{A}$

Ako prirodni broj nije djeljiv s 2, tada on završava s neparnom znamenkom.

Tvrdnja $A \Rightarrow B \leftsquigarrow$ istinita tvrdnja

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

Obrat tvrdnje $B \Rightarrow A$

Ako je prirodni broj djeljiv s 2, tada on završava s parnom znamenkom.

Suprotna tvrdnja $\overline{A} \Rightarrow \overline{B}$

Ako prirodni broj završava s neparnom znamenkom, tada on nije djeljiv s 2.

Kontrapozicija $\overline{B} \Rightarrow \overline{A}$

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Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

Obrat tvrdnje $B \Rightarrow A \leftsquigarrow$ istinita tvrdnja

Ako je prirodni broj djeljiv s 2, tada on završava s parnom znamenkom.

Suprotna tvrdnja $\overline{A} \Rightarrow \overline{B}$

Ako prirodni broj završava s neparnom znamenkom, tada on nije djeljiv s 2.

Kontrapozicija $\overline{B} \Rightarrow \overline{A}$

Ako prirodni broj nije djeljiv s 2, tada on završava s neparnom znamenkom.

Tvrdnja $A \Rightarrow B$ $\leftsquigarrow$ istinita tvrdnja

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

Obrat tvrdnje $B \Rightarrow A$ $\leftsquigarrow$ istinita tvrdnja

Ako je prirodni broj djeljiv s 2, tada on završava s parnom znamenkom.

Suprotna tvrdnja $\overline{A} \Rightarrow \overline{B}$ $\leftsquigarrow$ istinita tvrdnja

Ako prirodni broj završava s neparnom znamenkom, tada on nije djeljiv s 2.

Kontrapozicija $\overline{B} \Rightarrow \overline{A}$

Ako prirodni broj nije djeljiv s 2, tada on završava s neparnom znamenkom.

Tvrdnja $A \Rightarrow B \leftsquigarrow$ istinita tvrdnja

Ako prirodni broj završava s parnom znamenkom, tada je on djeljiv s 2.

Obrat tvrdnje $B \Rightarrow A \leftsquigarrow$ istinita tvrdnja

Ako je prirodni broj djeljiv s 2, tada on završava s parnom znamenkom.

Suprotna tvrdnja $\overline{A} \Rightarrow \overline{B} \leftsquigarrow$ istinita tvrdnja

Ako prirodni broj završava s neparnom znamenkom, tada on nije djeljiv s 2.

Kontrapozicija $\overline{B} \Rightarrow \overline{A} \leftsquigarrow$ istinita tvrdnja

Ako prirodni broj nije djeljiv s 2, tada on završava s neparnom znamenkom.

Ekvivalentne tvrdnje

- Ako su obje tvrdnje $A \Rightarrow B$ i $B \Rightarrow A$ istinite, tada govorimo da su tvrdnje A i B ekvivalentne tvrdnje i pišemo $A \Leftrightarrow B$.

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$$\boxed{A \Leftrightarrow B} \leftrightsquigarrow \boxed{A \Rightarrow B, \quad B \Rightarrow A}$$

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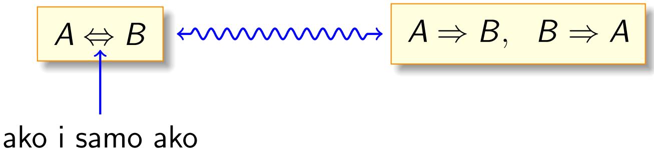

$A \Leftrightarrow B$

$A \Rightarrow B, \quad B \Rightarrow A$

ako i samo ako

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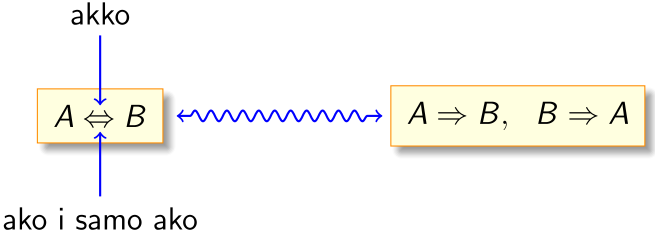

akko

$A \Leftrightarrow B$ $\leftrightsquigarrow$ $A \Rightarrow B, \quad B \Rightarrow A$

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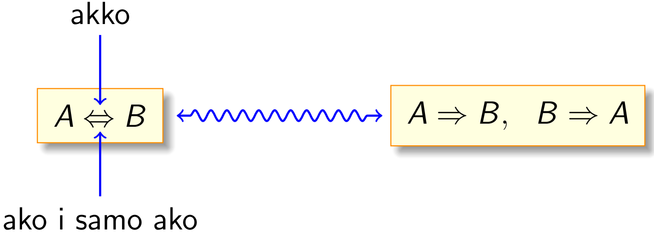

akko

$A \Leftrightarrow B$

$A \Rightarrow B, \quad B \Rightarrow A$

ako i samo ako

- A je nužan i dovoljan uvjet za B

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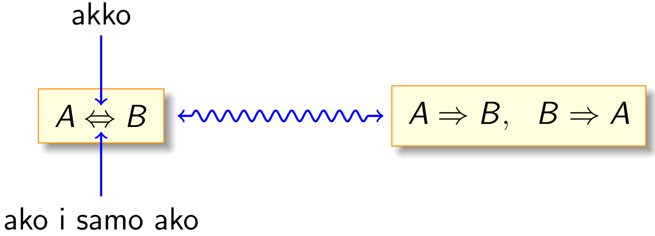

akko

$A \Leftrightarrow B$

$A \Rightarrow B, \quad B \Rightarrow A$

ako i samo ako

- A je nužan i dovoljan uvjet za B
- B je nužan i dovoljan uvjet za A

Primjer 2

Tvrdnja

Ako je prirodni broj djeljiv s 9, tada je on djeljiv s brojem 3 ili s brojem 2.

Primjer 2

Tvrdnja $A \Rightarrow B$

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$B =$ “prirodni broj je djeljiv s brojem 3 ili je djeljiv s brojem 2”

$\overline{A} =$

Primjer 2

Tvrdnja $A \Rightarrow B$

Ako je prirodni broj djeljiv s 9, tada
je on djeljiv s brojem 3 ili s brojem 2.

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Primjer 2

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$$\begin{aligned} A &= \text{“prirodni broj je djeljiv s 9”} \\ B &= \text{“prirodni broj je djeljiv s brojem 3 ili je djeljiv s brojem 2”} \\ \overline{A} &= \text{“prirodni broj nije djeljiv s 9”} \\ \overline{B} &= \end{aligned}$$

Primjer 2

Tvrdnja $A \Rightarrow B$

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De Morganovi zakoni

$$\overline{a \vee b} = \overline{a} \wedge \overline{b}$$

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Suprotna tvrdnja $\overline{A} \Rightarrow \overline{B}$

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Ako je prirodni broj djeljiv s 9, tada je on djeljiv s brojem 3 ili s brojem 2. (broj djeljiv s 9 je također djeljiv s 3)

Obrat tvrdnje $B \Rightarrow A$

Ako je prirodni broj djeljiv s brojem 3 ili je djeljiv s brojem 2, tada je on djeljiv s 9.

Suprotna tvrdnja $\overline{A} \Rightarrow \overline{B}$

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Ako prirodni broj nije djeljiv s brojem 3 i nije djeljiv s brojem 2, tada on nije djeljiv s 9. (broj koji nije djeljiv s 3, nije djeljiv niti s 9)

peti zadatak

Skupovi

Zadatak 5

Zadani su skupovi

$$A = \{x \in \mathbb{Z} \mid 3 < x \leqslant 8\},$$
$$B = \big\{x : x < 10 \land (x = 2n \text{ za neki } n \in \mathbb{N})\big\}.$$

Ispišite elemente skupova A i B te odredite skupove $A \cap B$, $A \cup B$, $A \setminus B$, $B \setminus A$, $A \triangle B$ i A^c ako je univerzalni skup $\mathcal{U} = \mathbb{N}$.

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Rješenje

$$A =$$

Skupovi

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Rješenje

$$A = \{4, 5, 6, 7, 8\}$$

Skupovi

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Rješenje

$$A = \{4, 5, 6, 7, 8\} \qquad B = \{2, 4, 6, 8\}$$

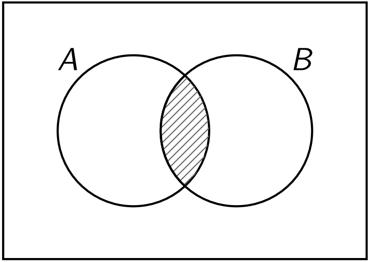
$\boxed{A = \{4, 5, 6, 7, 8\}}$ $\boxed{B = \{2, 4, 6, 8\}}$

$A \cap B =$

$A = \{4, 5, 6, 7, 8\}$

$B = \{2, 4, 6, 8\}$

$A \cap B =$



$A = \{4, 5, 6, 7, 8\}$ $B = \{2, 4, 6, 8\}$

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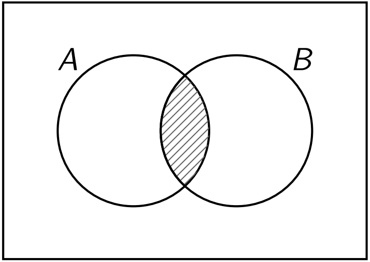

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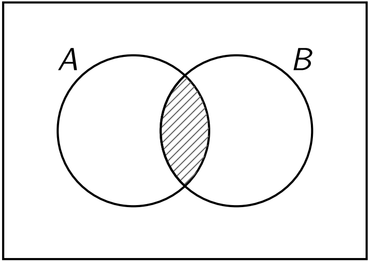

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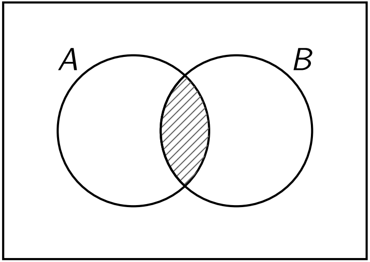

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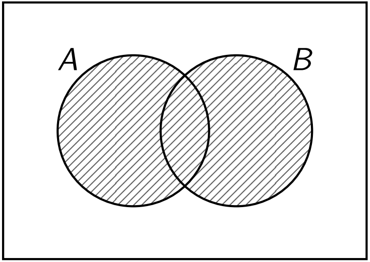

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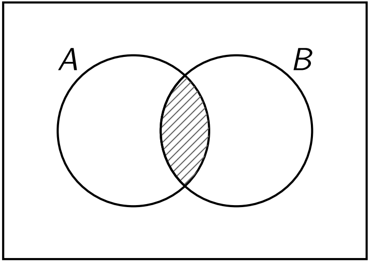

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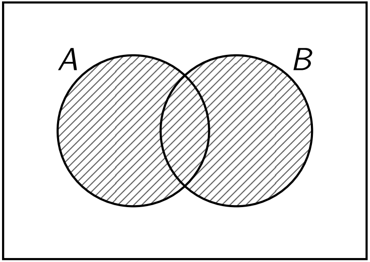

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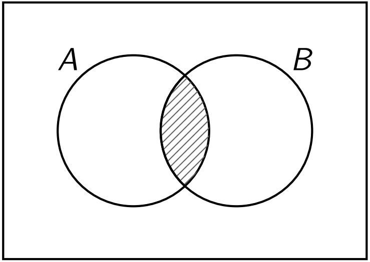
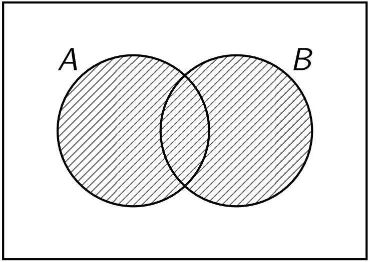


$A \cup B = \{4, 5, 6, 7, 8, 2$



$A = \{4, 5, 6, 7, 8\}$ $B = \{2, 4, 6, 8\}$

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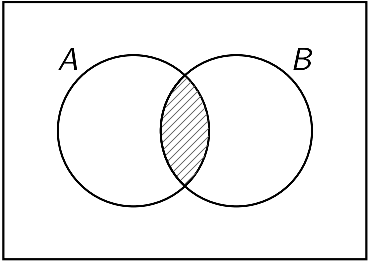
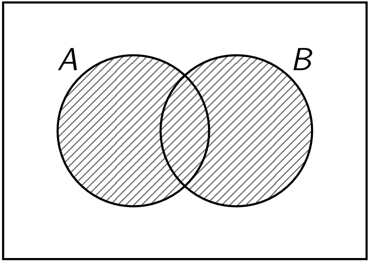


$A \cup B = \{4, 5, 6, 7, 8, 2\}$



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$A \setminus B =$

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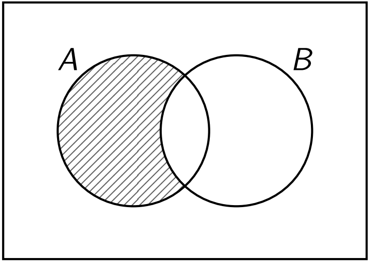

$A = \{4, 5, 6, 7, 8\}$

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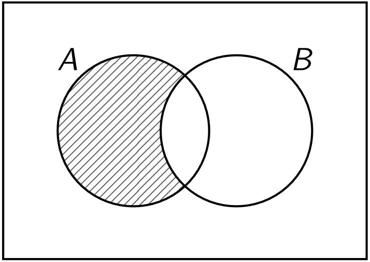

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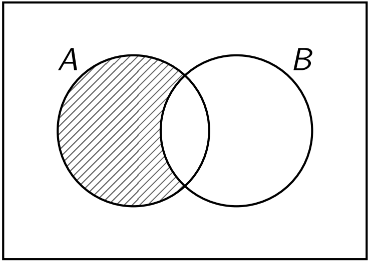
$A \setminus B = \{5, 7\}$

$B \setminus A =$



$A = \{4, 5, 6, 7, 8\}$ $B = \{2, 4, 6, 8\}$

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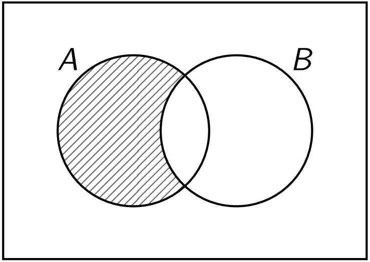
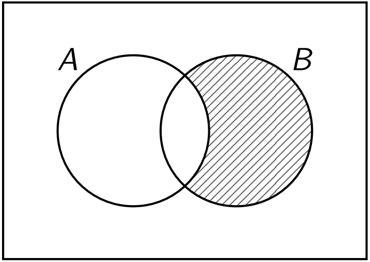


$B \setminus A =$



$\boxed{A = \{4, 5, 6, 7, 8\}}$ $\boxed{B = \{2, 4, 6, 8\}}$

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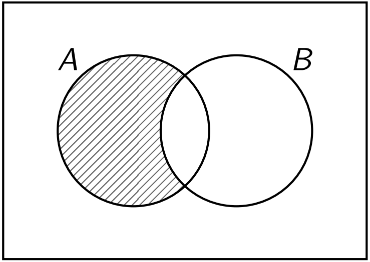
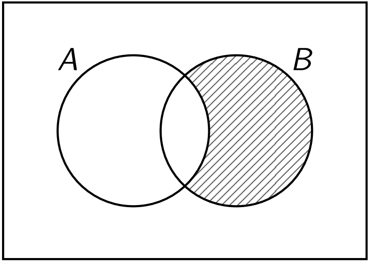


$B \setminus A = \{2\}$



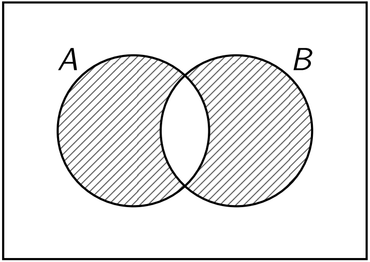
$\boxed{A = \{4, 5, 6, 7, 8\}}$ $\boxed{B = \{2, 4, 6, 8\}}$

$A \triangle B =$

$A = \{4, 5, 6, 7, 8\}$

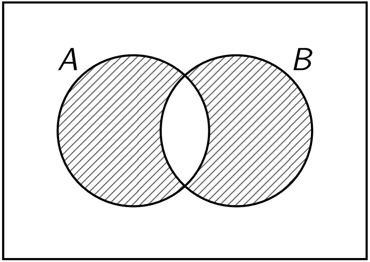
$B = \{2, 4, 6, 8\}$

$A \triangle B =$



$A = \{4, 5, 6, 7, 8\}$ $B = \{2, 4, 6, 8\}$

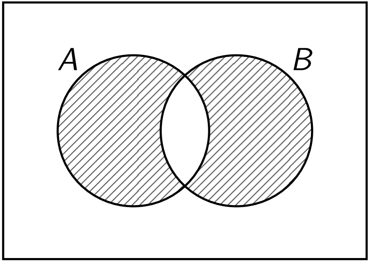
$A \triangle B =$



$$A \triangle B = (A \setminus B) \cup (B \setminus A)$$

$\boxed{A = \{4, 5, 6, 7, 8\}}$ $\boxed{B = \{2, 4, 6, 8\}}$

$A \mathbin{\triangle} B =$

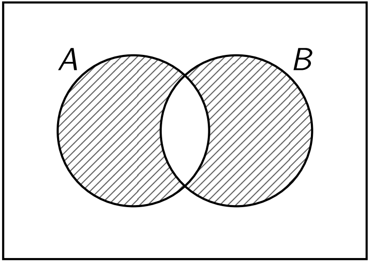


$$A \mathbin{\triangle} B \;=\; (A \setminus B) \cup (B \setminus A)$$

$$A \mathbin{\triangle} B \;=\; (A \cup B) \setminus (A \cap B)$$

$A = \{4, 5, 6, 7, 8\}$ $B = \{2, 4, 6, 8\}$

$A \triangle B =$



$$A \triangle B = (A \setminus B) \cup (B \setminus A)$$

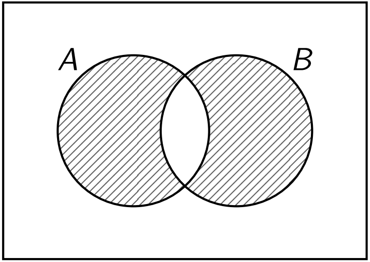
$$A \triangle B = (A \cup B) \setminus (A \cap B)$$

$A \cap B = \{4, 6, 8\}$

$A \setminus B = \{5, 7\}$ $B \setminus A = \{2\}$ $A \cup B = \{4, 5, 6, 7, 8, 2\}$

$A = \{4, 5, 6, 7, 8\}$ $B = \{2, 4, 6, 8\}$

$A \triangle B = \{2, 5, 7\}$



$$A \triangle B = (A \setminus B) \cup (B \setminus A)$$

$$A \triangle B = (A \cup B) \setminus (A \cap B)$$

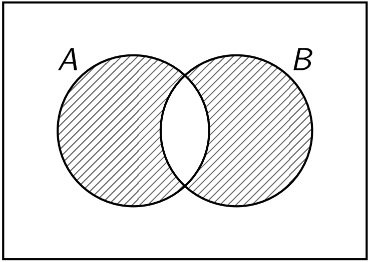
$A \cap B = \{4, 6, 8\}$

$A \setminus B = \{5, 7\}$ $B \setminus A = \{2\}$ $A \cup B = \{4, 5, 6, 7, 8, 2\}$

$\boxed{A = \{4, 5, 6, 7, 8\}}$ $\boxed{B = \{2, 4, 6, 8\}}$

$A \triangle B = \{2, 5, 7\}$

$A^c =$



$$A \triangle B = (A \setminus B) \cup (B \setminus A)$$

$$A \triangle B = (A \cup B) \setminus (A \cap B)$$

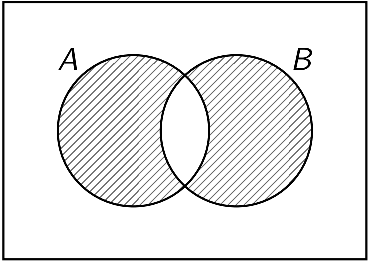
$\boxed{A \cap B = \{4, 6, 8\}}$

$\boxed{A \setminus B = \{5, 7\}}$ $\boxed{B \setminus A = \{2\}}$ $\boxed{A \cup B = \{4, 5, 6, 7, 8, 2\}}$

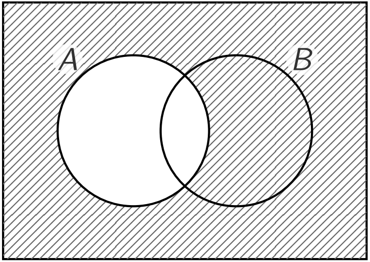
$A = \{4, 5, 6, 7, 8\}$

$B = \{2, 4, 6, 8\}$

$A \triangle B = \{2, 5, 7\}$



$A^c =$



$$A \triangle B = (A \setminus B) \cup (B \setminus A)$$

$$A \triangle B = (A \cup B) \setminus (A \cap B)$$

$A \cap B = \{4, 6, 8\}$

$A \setminus B = \{5, 7\}$

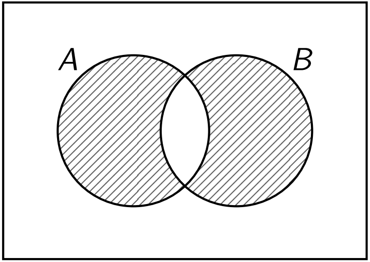
$B \setminus A = \{2\}$

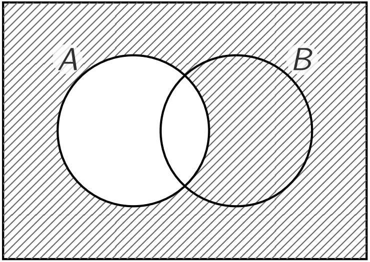
$A \cup B = \{4, 5, 6, 7, 8, 2\}$

$A = \{4, 5, 6, 7, 8\}$ $B = \{2, 4, 6, 8\}$

$\mathcal{U} = \mathbb{N}$

$A \triangle B = \{2, 5, 7\}$ $A^c =$





$$A \triangle B = (A \setminus B) \cup (B \setminus A)$$

$$A \triangle B = (A \cup B) \setminus (A \cap B)$$

$A \cap B = \{4, 6, 8\}$

$A \setminus B = \{5, 7\}$ $B \setminus A = \{2\}$ $A \cup B = \{4, 5, 6, 7, 8, 2\}$

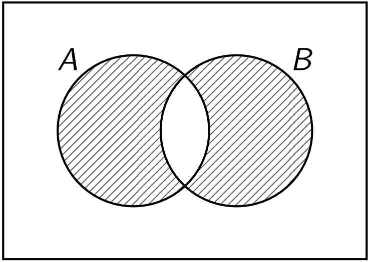
$A = \{4, 5, 6, 7, 8\}$

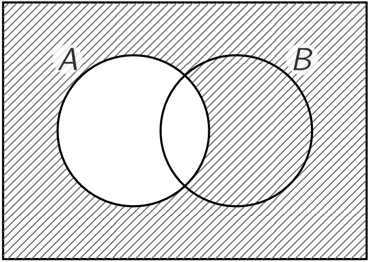
$B = \{2, 4, 6, 8\}$

$\mathcal{U} = \mathbb{N}$

$A \triangle B = \{2, 5, 7\}$

$A^c = \{1, 2, 3,$





$$A \triangle B = (A \setminus B) \cup (B \setminus A)$$

$$A \triangle B = (A \cup B) \setminus (A \cap B)$$

$A \cap B = \{4, 6, 8\}$

$A \setminus B = \{5, 7\}$

$B \setminus A = \{2\}$

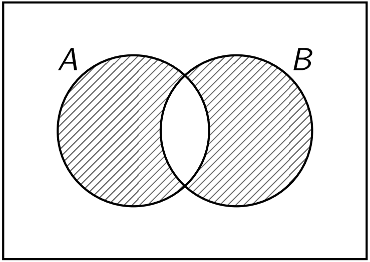
$A \cup B = \{4, 5, 6, 7, 8, 2\}$

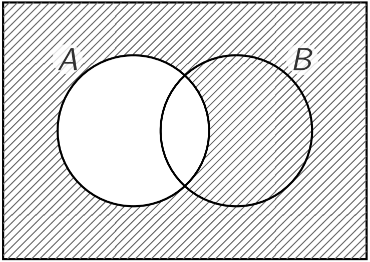
$\boxed{A = \{4, 5, 6, 7, 8\}}$ $\boxed{B = \{2, 4, 6, 8\}}$

$\boxed{\mathcal{U} = \mathbb{N}}$

$A \triangle B = \{2, 5, 7\}$

$A^c = \{1, 2, 3, 9,$





$$A \triangle B = (A \setminus B) \cup (B \setminus A)$$

$$A \triangle B = (A \cup B) \setminus (A \cap B)$$

$\boxed{A \cap B = \{4, 6, 8\}}$

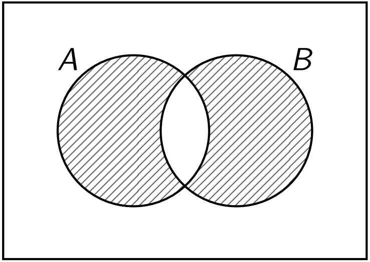
$\boxed{A \setminus B = \{5, 7\}}$ $\boxed{B \setminus A = \{2\}}$ $\boxed{A \cup B = \{4, 5, 6, 7, 8, 2\}}$

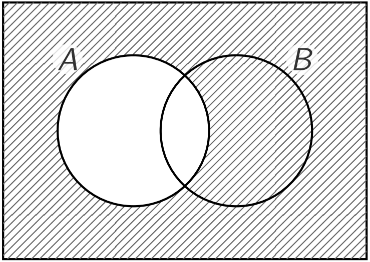
$\boxed{A = \{4, 5, 6, 7, 8\}}$ $\boxed{B = \{2, 4, 6, 8\}}$

$\boxed{\mathcal{U} = \mathbb{N}}$

$A \triangle B = \{2, 5, 7\}$

$A^c = \{1, 2, 3, 9, 10,$





$$A \triangle B = (A \setminus B) \cup (B \setminus A)$$

$$A \triangle B = (A \cup B) \setminus (A \cap B)$$

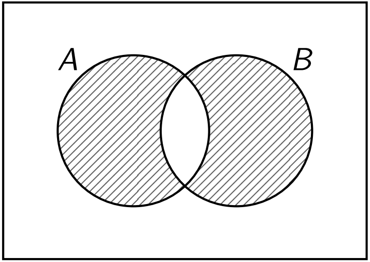
$\boxed{A \cap B = \{4, 6, 8\}}$

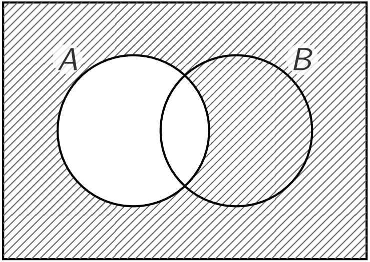
$\boxed{A \setminus B = \{5, 7\}}$ $\boxed{B \setminus A = \{2\}}$ $\boxed{A \cup B = \{4, 5, 6, 7, 8, 2\}}$

$A = \{4, 5, 6, 7, 8\}$ $B = \{2, 4, 6, 8\}$

$\mathcal{U} = \mathbb{N}$

$A \bigtriangleup B = \{2, 5, 7\}$ $A^c = \{1, 2, 3, 9, 10, 11,$





$$A \bigtriangleup B = (A \setminus B) \cup (B \setminus A)$$

$$A \bigtriangleup B = (A \cup B) \setminus (A \cap B)$$

$A \cap B = \{4, 6, 8\}$

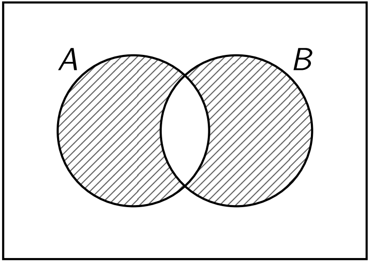
$A \setminus B = \{5, 7\}$ $B \setminus A = \{2\}$ $A \cup B = \{4, 5, 6, 7, 8, 2\}$

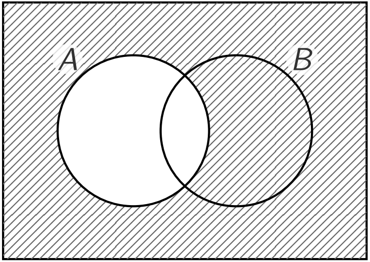
$A = \{4, 5, 6, 7, 8\}$ $B = \{2, 4, 6, 8\}$

$\mathcal{U} = \mathbb{N}$

$A \triangle B = \{2, 5, 7\}$

$A^c = \{1, 2, 3, 9, 10, 11, 12,$





$$A \triangle B = (A \setminus B) \cup (B \setminus A)$$

$$A \triangle B = (A \cup B) \setminus (A \cap B)$$

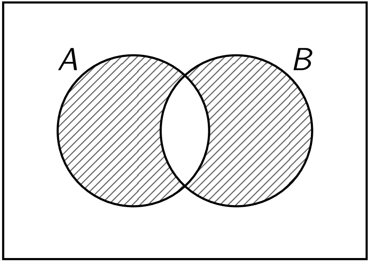
$A \cap B = \{4, 6, 8\}$

$A \setminus B = \{5, 7\}$ $B \setminus A = \{2\}$ $A \cup B = \{4, 5, 6, 7, 8, 2\}$

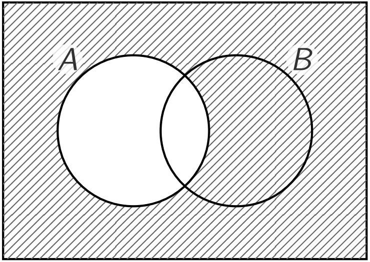
$\boxed{A = \{4, 5, 6, 7, 8\}}$ $\boxed{B = \{2, 4, 6, 8\}}$

$\boxed{\mathcal{U} = \mathbb{N}}$

$A \triangle B = \{2, 5, 7\}$



$A^c = \{1, 2, 3, 9, 10, 11, 12, \dots\}$



$$A \triangle B = (A \setminus B) \cup (B \setminus A)$$

$$A \triangle B = (A \cup B) \setminus (A \cap B)$$

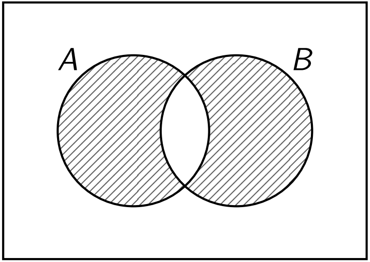
$\boxed{A \cap B = \{4, 6, 8\}}$

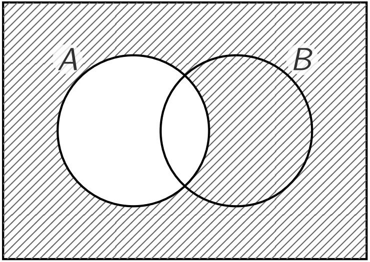
$\boxed{A \setminus B = \{5, 7\}}$ $\boxed{B \setminus A = \{2\}}$ $\boxed{A \cup B = \{4, 5, 6, 7, 8, 2\}}$

$A = \{4, 5, 6, 7, 8\}$ $B = \{2, 4, 6, 8\}$

$\mathcal{U} = \mathbb{N}$

$A \triangle B = \{2, 5, 7\}$ $A^c = \{1, 2, 3, 9, 10, 11, 12, \dots\}$





$$A \triangle B \;=\; (A \setminus B) \cup (B \setminus A)$$

$$A \triangle B \;=\; (A \cup B) \setminus (A \cap B)$$

$$A^c = \left\{x \in \mathbb{N} : (x \leqslant 3) \vee (x \geqslant 9)\right\}$$

$A \cap B = \{4, 6, 8\}$

$A \setminus B = \{5, 7\}$ $B \setminus A = \{2\}$ $A \cup B = \{4, 5, 6, 7, 8, 2\}$

šesti zadatak

Zadatak 6

Zadani su skupovi

$$A = \{x \in \mathbb{Z} : |x-1| < 3\} \quad i \quad B = \{x \in \mathbb{N} : x^2 \leqslant 10\}.$$

Ispišite elemente skupova A i B te odredite skup $\mathcal{P}(A \cap B)$.

Rješenje

$$|x - 1| < 3$$

Rješenje

$$|x - 1| < 3$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1|<3$$

1. slučaj

$$x-1 \geqslant 0$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1| < 3$$

1. slučaj

$$x - 1 \geqslant 0$$

$$x \geqslant 1$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1|<3$$

1. slučaj

$$x-1 \geqslant 0$$

$$\boxed{x \geqslant 1}$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1|<3$$

1. slučaj

$$x-1 \geqslant 0$$

uvjet $\boxed{x \geqslant 1}$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1| < 3$$

1. slučaj

$$x - 1 \geqslant 0$$

uvjet $\rightsquigarrow \boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1|<3$$

1. slučaj

$$x-1 \geqslant 0$$

$$\text{uvjet} \rightsquigarrow \boxed{x \geqslant 1}$$

$$x-1<3$$

$$x<4$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1| < 3$$

1. slučaj

$$x - 1 \geqslant 0$$

uvjet $\rightsquigarrow$ $\boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1| < 3$$

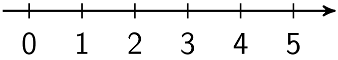
1. slučaj

$$x - 1 \geqslant 0$$

uvjet $\rightsquigarrow \boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$



$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1| < 3$$

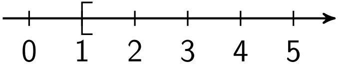
1. slučaj

$$x - 1 \geqslant 0$$

uvjet ⇝ $\boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$



$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1| < 3$$

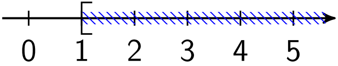
1. slučaj

$$x-1 \geqslant 0$$

uvjet $\boxed{x \geqslant 1}$

$$x-1 < 3$$

$$\boxed{x < 4}$$



$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1| < 3$$

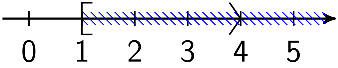
1. slučaj

$$x - 1 \geqslant 0$$

uvjet $\rightsquigarrow$ $\boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$



$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1| < 3$$

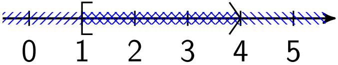
1. slučaj

$$x - 1 \geqslant 0$$

uvjet $\boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$



$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1| < 3$$

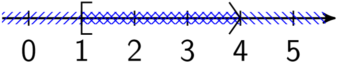
1. slučaj

$$x - 1 \geqslant 0$$

uvjet $\boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$



$$x \in [1, 4\rangle$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1| < 3$$

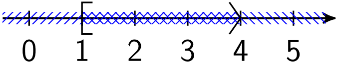
1. slučaj

$$x - 1 \geqslant 0$$

uvjet $\boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$



$$\boxed{x \in [1, 4\rangle}$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1|<3$$

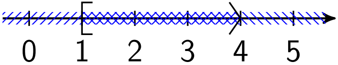
1. slučaj

$$x-1\geqslant 0$$

uvjet $\rightsquigarrow$ $\boxed{x\geqslant 1}$

$$x-1<3$$

$$\boxed{x<4}$$



$$\boxed{x\in[1,4\rangle}$$

2. slučaj

$$x-1<0$$

$$|a|=\begin{cases} a, & a\geqslant 0\\ -a, & a<0\end{cases}$$

Rješenje

$$|x-1| < 3$$

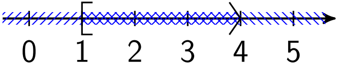
1. slučaj

$$x - 1 \geqslant 0$$

uvjet $\rightsquigarrow \boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$



$$\boxed{x \in [1, 4\rangle}$$

2. slučaj

$$x - 1 < 0$$

$$x < 1$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1|<3$$

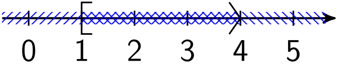
1. slučaj

$$x-1 \geqslant 0$$

uvjet $\rightsquigarrow$ $\boxed{x \geqslant 1}$

$$x-1<3$$

$$\boxed{x<4}$$



$$\boxed{x \in [1,4\rangle}$$

2. slučaj

$$x-1<0$$

$$\boxed{x<1}$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a<0 \end{cases}$$

Rješenje

$$|x-1|<3$$

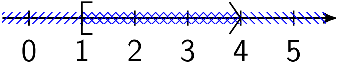
1. slučaj

$$x-1 \geqslant 0$$

uvjet $\boxed{x \geqslant 1}$

$$x-1<3$$

$$\boxed{x<4}$$



$$\boxed{x \in [1,4\rangle}$$

2. slučaj

$$x-1<0$$

uvjet $\boxed{x<1}$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a<0 \end{cases}$$

Rješenje

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

$$|x-1|<3$$

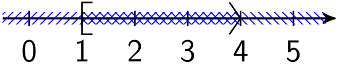
1. slučaj

$$x-1 \geqslant 0$$

uvjet $\rightsquigarrow \boxed{x \geqslant 1}$

$$x-1<3$$

$$\boxed{x<4}$$



$$\boxed{x \in [1,4\rangle}$$

2. slučaj

$$x-1<0$$

uvjet $\rightsquigarrow \boxed{x<1}$

$$-(x-1)<3$$

Rješenje

$$|x-1|<3$$

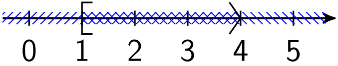
1. slučaj

$$x-1\geqslant 0$$

uvjet $\rightsquigarrow$ $\boxed{x\geqslant 1}$

$$x-1<3$$

$$\boxed{x<4}$$



$$\boxed{x\in[1,4\rangle}$$

2. slučaj

$$x-1<0$$

uvjet $\rightsquigarrow$ $\boxed{x<1}$

$$-(x-1)<3$$

$$-x+1<3$$

$$|a|=\begin{cases} a, & a\geqslant 0\\ -a, & a<0\end{cases}$$

Rješenje

$$|x-1| < 3$$

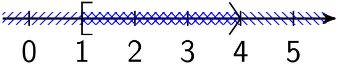
1. slučaj

$$x-1 \geqslant 0$$

uvjet $\rightsquigarrow$ $\boxed{x \geqslant 1}$

$$x-1 < 3$$

$$\boxed{x < 4}$$



$$\boxed{x \in [1, 4\rangle}$$

2. slučaj

$$x-1 < 0$$

uvjet $\rightsquigarrow$ $\boxed{x < 1}$

$$-(x-1) < 3$$

$$-x+1 < 3$$

$$-x < 2$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1| < 3$$

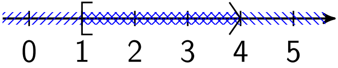
1. slučaj

$$x - 1 \geqslant 0$$

uvjet $\rightsquigarrow \boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$



$$\boxed{x \in [1, 4\rangle}$$

2. slučaj

$$x - 1 < 0$$

uvjet $\rightsquigarrow \boxed{x < 1}$

$$-(x-1) < 3$$

$$-x + 1 < 3$$

$$-x < 2$$

$$x > -2$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1| < 3$$

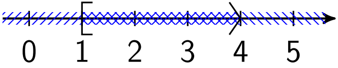
1. slučaj

$$x - 1 \geqslant 0$$

uvjet $\rightsquigarrow$ $\boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$



$$\boxed{x \in [1, 4\rangle}$$

2. slučaj

$$x - 1 < 0$$

uvjet $\rightsquigarrow$ $\boxed{x < 1}$

$$-(x-1) < 3$$

$$-x + 1 < 3$$

$$-x < 2$$

$$\boxed{x > -2}$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1|<3$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

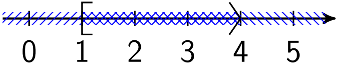
1. slučaj

$$x-1 \geqslant 0$$

uvjet $\rightsquigarrow \boxed{x \geqslant 1}$

$$x-1<3$$

$$\boxed{x<4}$$



$$\boxed{x \in [1,4\rangle}$$

2. slučaj

$$x-1<0$$

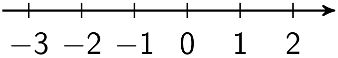
uvjet $\rightsquigarrow \boxed{x < 1}$

$$-(x-1)<3$$

$$-x+1<3$$

$$-x<2$$

$$\boxed{x>-2}$$



Rješenje

$$|x-1| < 3$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

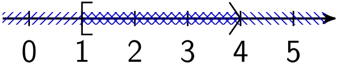
1. slučaj

$$x - 1 \geqslant 0$$

uvjet $\rightsquigarrow \boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$



$$\boxed{x \in [1, 4\rangle}$$

2. slučaj

$$x - 1 < 0$$

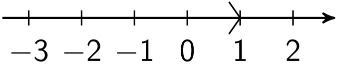
uvjet $\rightsquigarrow \boxed{x < 1}$

$$-(x-1) < 3$$

$$-x + 1 < 3$$

$$-x < 2$$

$$\boxed{x > -2}$$



Rješenje

$$|x-1| < 3$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

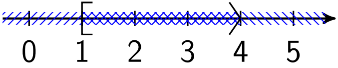
1. slučaj

$$x - 1 \geqslant 0$$

uvjet $\rightsquigarrow$ $\boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$



$$\boxed{x \in [1, 4\rangle}$$

2. slučaj

$$x - 1 < 0$$

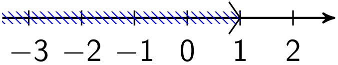
uvjet $\rightsquigarrow$ $\boxed{x < 1}$

$$-(x-1) < 3$$

$$-x + 1 < 3$$

$$-x < 2$$

$$\boxed{x > -2}$$



Rješenje

$$|x-1|<3$$

$$|a|=\begin{cases} a, & a\geqslant 0\\ -a, & a<0\end{cases}$$

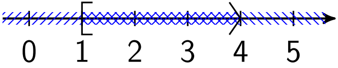
1. slučaj

$$x-1\geqslant 0$$

uvjet $\rightsquigarrow \boxed{x\geqslant 1}$

$$x-1<3$$

$$\boxed{x<4}$$



$$\boxed{x\in[1,4\rangle}$$

2. slučaj

$$x-1<0$$

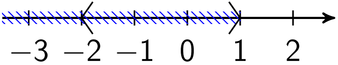
uvjet $\rightsquigarrow \boxed{x<1}$

$$-(x-1)<3$$

$$-x+1<3$$

$$-x<2$$

$$\boxed{x>-2}$$



Rješenje

$$|x-1| < 3$$

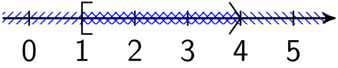
1. slučaj

$$x-1 \geqslant 0$$

uvjet $\rightsquigarrow \boxed{x \geqslant 1}$

$$x-1 < 3$$

$$\boxed{x < 4}$$



$$\boxed{x \in [1,4\rangle}$$

2. slučaj

$$x-1 < 0$$

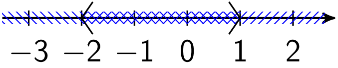
uvjet $\rightsquigarrow \boxed{x < 1}$

$$-(x-1) < 3$$

$$-x+1 < 3$$

$$-x < 2$$

$$\boxed{x > -2}$$



$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

Rješenje

$$|x-1| < 3$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

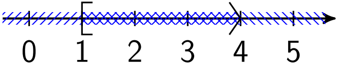
1. slučaj

$$x - 1 \geqslant 0$$

uvjet $\rightsquigarrow \boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$



$$\boxed{x \in [1, 4\rangle}$$

2. slučaj

$$x - 1 < 0$$

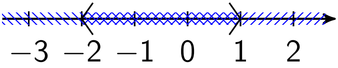
uvjet $\rightsquigarrow \boxed{x < 1}$

$$-(x-1) < 3$$

$$-x + 1 < 3$$

$$-x < 2$$

$$\boxed{x > -2}$$



$$x \in \langle -2, 1\rangle$$

Rješenje

$$|x-1|<3$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

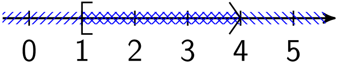
1. slučaj

$$x-1 \geqslant 0$$

uvjet $\rightsquigarrow \boxed{x \geqslant 1}$

$$x-1<3$$

$$\boxed{x<4}$$



$$\boxed{x \in [1,4\rangle}$$

2. slučaj

$$x-1<0$$

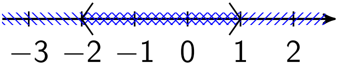
uvjet $\rightsquigarrow \boxed{x<1}$

$$-(x-1)<3$$

$$-x+1<3$$

$$-x<2$$

$$\boxed{x>-2}$$



$$\boxed{x \in \langle -2,1\rangle}$$

Rješenje

$$|x-1| < 3$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

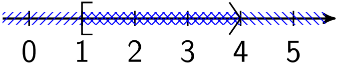
1. slučaj

$$x - 1 \geqslant 0$$

uvjet $\rightsquigarrow \boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$



$$\boxed{x \in [1, 4\rangle}$$

2. slučaj

$$x - 1 < 0$$

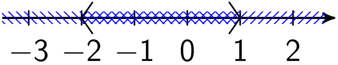
uvjet $\rightsquigarrow \boxed{x < 1}$

$$-(x-1) < 3$$

$$-x + 1 < 3$$

$$-x < 2$$

$$\boxed{x > -2}$$



$$\boxed{x \in \langle -2, 1\rangle}$$

KONAČNO RJEŠENJE:

Rješenje

$$|x-1|<3$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

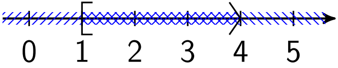
1. slučaj

$$x-1 \geqslant 0$$

uvjet $\rightsquigarrow$ $\boxed{x \geqslant 1}$

$$x-1<3$$

$$\boxed{x<4}$$



$$\boxed{x \in [1,4\rangle}$$

2. slučaj

$$x-1<0$$

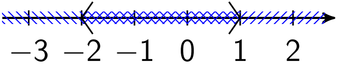
uvjet $\rightsquigarrow$ $\boxed{x<1}$

$$-(x-1)<3$$

$$-x+1<3$$

$$-x<2$$

$$\boxed{x>-2}$$



$$\boxed{x \in \langle -2,1\rangle}$$

KONAČNO RJEŠENJE: $x \in \langle -2,1\rangle \cup [1,4\rangle$

Rješenje

$$|x-1| < 3$$

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

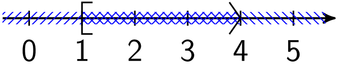
1. slučaj

$$x - 1 \geqslant 0$$

uvjet $\rightsquigarrow \boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$



$$\boxed{x \in [1, 4\rangle}$$

2. slučaj

$$x - 1 < 0$$

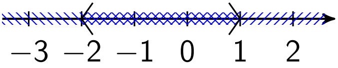
uvjet $\rightsquigarrow \boxed{x < 1}$

$$-(x-1) < 3$$

$$-x + 1 < 3$$

$$-x < 2$$

$$\boxed{x > -2}$$



$$\boxed{x \in \langle -2, 1\rangle}$$

KONAČNO RJEŠENJE: $x \in \langle -2, 1\rangle \cup [1, 4\rangle$

$$x \in \langle -2, 4\rangle$$

Rješenje

$$|a| = \begin{cases} a, & a \geqslant 0 \\ -a, & a < 0 \end{cases}$$

$$|x-1| < 3$$

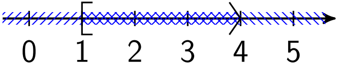
1. slučaj

$$x - 1 \geqslant 0$$

uvjet ⇝ $\boxed{x \geqslant 1}$

$$x - 1 < 3$$

$$\boxed{x < 4}$$



$$\boxed{x \in [1, 4\rangle}$$

2. slučaj

$$x - 1 < 0$$

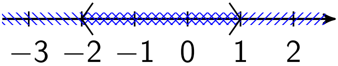
uvjet ⇝ $\boxed{x < 1}$

$$-(x-1) < 3$$

$$-x + 1 < 3$$

$$-x < 2$$

$$\boxed{x > -2}$$



$$\boxed{x \in \langle -2, 1\rangle}$$

KONAČNO RJEŠENJE: $x \in \langle -2, 1\rangle \cup [1, 4\rangle$

$$\boxed{\boxed{x \in \langle -2, 4\rangle}}$$

$$\boxed{A = \left\{x \in \mathbb{Z} : |x - 1| < 3\right\}} \qquad \boxed{B = \left\{x \in \mathbb{N} : x^2 \leqslant 10\right\}}$$

$x \in \langle -2, 4 \rangle$

$$\boxed{A = \{x \in \mathbb{Z} : |x-1| < 3\}} \qquad \boxed{B = \{x \in \mathbb{N} : x^2 \leqslant 10\}}$$

$x \in \langle -2, 4 \rangle$ $\rightsquigarrow$ rješenje nejednadžbe $|x-1| < 3$ u skupu $\mathbb{R}$

$$\boxed{A = \left\{x \in \mathbb{Z} : |x - 1| < 3\right\}} \qquad \boxed{B = \left\{x \in \mathbb{N} : x^2 \leqslant 10\right\}}$$

$x \in \langle -2, 4\rangle \rightsquigarrow$ rješenje nejednadžbe $|x - 1| < 3$ u skupu $\mathbb{R}$

$$A =$$

$$\boxed{A = \{x \in \mathbb{Z} : |x-1| < 3\}} \qquad \boxed{B = \{x \in \mathbb{N} : x^2 \leqslant 10\}}$$

$x \in \langle -2, 4 \rangle \rightsquigarrow$ rješenje nejednadžbe $|x-1| < 3$ u skupu $\mathbb{R}$

$$A = \{-1,$$

$\boxed{A = \left\{x \in \mathbb{Z} : |x-1| < 3\right\}}$ $\boxed{B = \left\{x \in \mathbb{N} : x^2 \leqslant 10\right\}}$

$x \in \langle -2, 4 \rangle$ $\rightsquigarrow$ rješenje nejednadžbe $|x-1| < 3$ u skupu $\mathbb{R}$

$$A = \{-1, 0,$$

$$\boxed{A = \left\{x \in \mathbb{Z} : |x - 1| < 3\right\}}$$

$$\boxed{B = \left\{x \in \mathbb{N} : x^2 \leqslant 10\right\}}$$

$x \in \langle -2, 4\rangle \rightsquigarrow$ rješenje nejednadžbe $|x - 1| < 3$ u skupu $\mathbb{R}$

$$A = \{-1, 0, 1,$$

$$\boxed{A = \left\{x \in \mathbb{Z} : |x-1| < 3\right\}} \qquad \boxed{B = \left\{x \in \mathbb{N} : x^2 \leqslant 10\right\}}$$

$x \in \langle -2, 4 \rangle \rightsquigarrow$ rješenje nejednadžbe $|x-1| < 3$ u skupu $\mathbb{R}$

$$A = \{-1, 0, 1, 2,$$

$\boxed{A = \left\{x \in \mathbb{Z} : |x-1| < 3\right\}}$ $\boxed{B = \left\{x \in \mathbb{N} : x^2 \leqslant 10\right\}}$

$x \in \langle -2, 4 \rangle$ $\rightsquigarrow$ rješenje nejednadžbe $|x-1| < 3$ u skupu $\mathbb{R}$

$$A = \{-1, 0, 1, 2, 3\}$$

$\boxed{A = \{x \in \mathbb{Z} : |x-1| < 3\}}$ $\boxed{B = \{x \in \mathbb{N} : x^2 \leqslant 10\}}$

$x \in \langle -2, 4\rangle \rightsquigarrow$ rješenje nejednadžbe $|x-1| < 3$ u skupu $\mathbb{R}$

$A = \{-1, 0, 1, 2, 3\}$ $B =$

$\boxed{A = \{x \in \mathbb{Z} : |x-1| < 3\}}$ $\boxed{B = \{x \in \mathbb{N} : x^2 \leqslant 10\}}$

$x \in \langle -2, 4 \rangle \rightsquigarrow$ rješenje nejednadžbe $|x-1| < 3$ u skupu $\mathbb{R}$

$$A = \{-1, 0, 1, 2, 3\} \qquad B = \{1, 2, 3\}$$

$$\boxed{A = \{x \in \mathbb{Z} : |x-1| < 3\}} \qquad \boxed{B = \{x \in \mathbb{N} : x^2 \leqslant 10\}}$$

$x \in \langle -2, 4\rangle \rightsquigarrow$ rješenje nejednadžbe $|x-1| < 3$ u skupu $\mathbb{R}$

$$A = \{-1, 0, 1, 2, 3\} \qquad B = \{1, 2, 3\}$$

$$\mathcal{P}(A \cap B) =$$

$$\boxed{A = \left\{x \in \mathbb{Z} : |x-1| < 3\right\}} \qquad \boxed{B = \left\{x \in \mathbb{N} : x^2 \leqslant 10\right\}}$$

$x \in \langle -2, 4\rangle$ $\rightsquigarrow$ rješenje nejednadžbe $|x-1| < 3$ u skupu $\mathbb{R}$

$$A = \{-1, 0, 1, 2, 3\} \qquad B = \{1, 2, 3\}$$

$$A \cap B =$$

$$\mathcal{P}(A \cap B) =$$

$\boxed{A = \left\{x \in \mathbb{Z} : |x-1| < 3\right\}}$ $\boxed{B = \left\{x \in \mathbb{N} : x^2 \leqslant 10\right\}}$

$x \in \langle -2, 4 \rangle \rightsquigarrow$ rješenje nejednadžbe $|x-1| < 3$ u skupu $\mathbb{R}$

$$A = \{-1, 0, 1, 2, 3\} \qquad B = \{1, 2, 3\}$$

$$A \cap B = \{1, 2, 3\}$$

$\mathcal{P}(A \cap B) =$

$$\boxed{A = \left\{x \in \mathbb{Z} : |x - 1| < 3\right\}} \qquad \boxed{B = \left\{x \in \mathbb{N} : x^2 \leqslant 10\right\}}$$

$x \in \langle -2, 4\rangle \rightsquigarrow$ rješenje nejednadžbe $|x - 1| < 3$ u skupu $\mathbb{R}$

$$A = \{-1, 0, 1, 2, 3\} \qquad B = \{1, 2, 3\}$$

$$A \cap B = \{1, 2, 3\}$$

$\mathcal{P}(A \cap B) = \Big\{$

$$\boxed{A = \left\{x \in \mathbb{Z} : |x-1| < 3\right\}} \qquad \boxed{B = \left\{x \in \mathbb{N} : x^2 \leqslant 10\right\}}$$

$x \in \langle -2, 4 \rangle \rightsquigarrow$ rješenje nejednadžbe $|x-1| < 3$ u skupu $\mathbb{R}$

$$A = \{-1, 0, 1, 2, 3\} \qquad B = \{1, 2, 3\}$$

$$A \cap B = \{1, 2, 3\}$$

$$\mathcal{P}(A \cap B) = \{\emptyset,$$

$\boxed{A = \left\{x \in \mathbb{Z} : |x-1| < 3\right\}}$ $\boxed{B = \left\{x \in \mathbb{N} : x^2 \leqslant 10\right\}}$

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$$A = \{-1, 0, 1, 2, 3\} \qquad B = \{1, 2, 3\}$$

$$A \cap B = \{1, 2, 3\}$$

$$\mathcal{P}(A \cap B) = \{\emptyset, \{1\},$$

$$\boxed{A = \{x \in \mathbb{Z} : |x-1| < 3\}} \qquad \boxed{B = \{x \in \mathbb{N} : x^2 \leqslant 10\}}$$

$x \in \langle -2, 4\rangle$ $\rightsquigarrow$ rješenje nejednadžbe $|x-1| < 3$ u skupu $\mathbb{R}$

$$A = \{-1, 0, 1, 2, 3\} \qquad B = \{1, 2, 3\}$$

$$A \cap B = \{1, 2, 3\}$$

$$\mathcal{P}(A \cap B) = \{\emptyset, \{1\}, \{2\},$$

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$$\boxed{k(\mathcal{P}(S)) = 2^{k(S)}}$$

$$\boxed{A = \left\{x \in \mathbb{Z} : |x-1| < 3\right\}} \qquad \boxed{B = \left\{x \in \mathbb{N} : x^2 \leqslant 10\right\}}$$

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Koje relacije vrijede između skupova A i B?

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Koje relacije vrijede između skupova A i B?

$$k(\mathcal{P}(S)) = 2^{k(S)}$$

$$B \subseteq A, \quad B \subset A$$

sedmi zadatak

Zadatak 7

Zadani su skupovi

$$A = \left\{x \in \mathbb{Z} \mid x^2 - x - 2 \leqslant 0\right\} \quad i \quad B = \left\{x \in \mathbb{N} \mid 4 - x > 0\right\}.$$

Ispišite elemente skupova A i B te odredite njihovu simetričnu razliku.

Rješenje

$$4 - x > 0$$

Rješenje

$$\begin{aligned} 4 - x &> 0 \\ -x &> -4 \end{aligned}$$

Rješenje

$$\begin{aligned} 4 - x &> 0 \\ -x &> -4 \\ x &< 4 \end{aligned}$$

Rješenje

$$\begin{aligned} 4 - x &> 0 \\ -x &> -4 \\ x &< 4 \end{aligned}$$

$$x \in \langle -\infty, 4 \rangle$$

Rješenje

$$4 - x > 0$$

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$$x < 4$$

$$\boxed{x \in \langle -\infty, 4 \rangle}$$

Rješenje

$$4 - x > 0$$

$$-x > -4$$

$$x < 4$$

$$\boxed{x \in \langle -\infty, 4\rangle}$$

$$x^2 - x - 2 \leqslant 0$$

Rješenje

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$$x < 4$$

$$\boxed{x \in \langle -\infty, 4\rangle}$$

$$x^2 - x - 2 \leqslant 0$$

$$x^2 - x - 2 = 0$$

Rješenje

$$ax^2 + bx + c = 0$$

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$4 - x > 0$$

$$-x > -4$$

$$x < 4$$

$$\boxed{x \in \langle -\infty, 4\rangle}$$

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$$x_{1,2} = \frac{1 \pm 3}{2}$$

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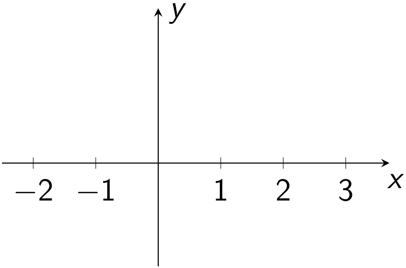

$$x^2 - x - 2 \leqslant 0$$

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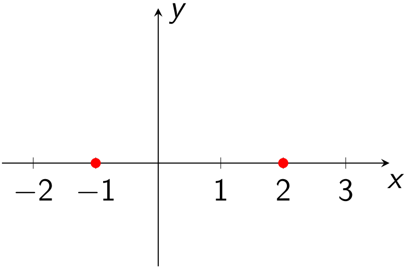

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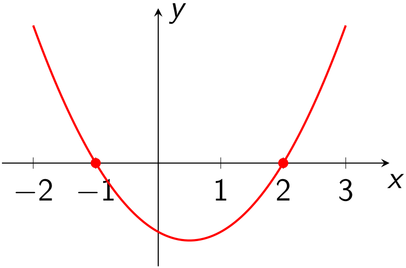

$$x^2 - x - 2 \leqslant 0$$
$$x^2 - x - 2 = 0$$
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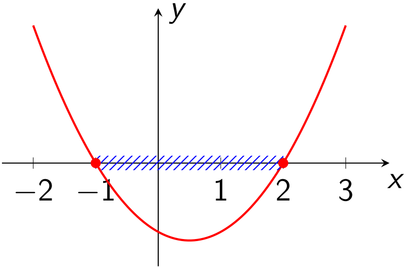

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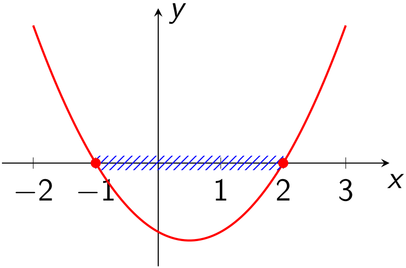

$$x \in [-1, 2]$$

Rješenje

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$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$4 - x > 0$$

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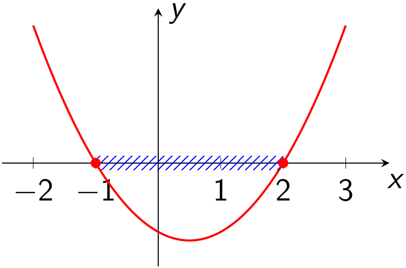

$$\boxed{x \in [-1, 2]}$$

$$\boxed{A = \left\{x \in \mathbb{Z} \mid x^2 - x - 2 \leqslant 0\right\}} \qquad \boxed{B = \left\{x \in \mathbb{N} \mid 4 - x > 0\right\}}$$

$x \in \langle -\infty, 4\rangle$

$$\boxed{A = \{x \in \mathbb{Z} \mid x^2 - x - 2 \leqslant 0\}} \qquad \boxed{B = \{x \in \mathbb{N} \mid 4 - x > 0\}}$$

$x \in \langle -\infty, 4\rangle$ $\rightsquigarrow$ rješenje nejednadžbe $4 - x > 0$ u skupu $\mathbb{R}$

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$$A =$$

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$$A = \{-1, 0, 1, 2\} \qquad B =$$

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$$A = \{-1, 0, 1, 2\} \qquad B = \{1, 2, 3\}$$

$$A \triangle B =$$

$\boxed{A = \{x \in \mathbb{Z} \mid x^2 - x - 2 \leqslant 0\}}$ $\boxed{B = \{x \in \mathbb{N} \mid 4 - x > 0\}}$

$x \in \langle -\infty, 4\rangle \rightsquigarrow$ rješenje nejednadžbe $4 - x > 0$ u skupu $\mathbb{R}$

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$A = \{-1, 0, 1, 2\}$ $B = \{1, 2, 3\}$

$$A \triangle B =$$

$$A \triangle B = (A \cup B) \setminus (A \cap B)$$

$$A \triangle B = (A \setminus B) \cup (B \setminus A)$$

$$\boxed{A = \{x \in \mathbb{Z} \mid x^2 - x - 2 \leqslant 0\}} \qquad \boxed{B = \{x \in \mathbb{N} \mid 4 - x > 0\}}$$

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$x \in [-1, 2] \rightsquigarrow$ rješenje nejednadžbe $x^2 - x - 2 \leqslant 0$ u skupu $\mathbb{R}$

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$$A \triangle B =$$

$$A \triangle B = (A \cup B) \setminus (A \cap B)$$

$$A \triangle B = (A \setminus B) \cup (B \setminus A)$$

$\boxed{A = \{x \in \mathbb{Z} \mid x^2 - x - 2 \leqslant 0\}}$ $\boxed{B = \{x \in \mathbb{N} \mid 4 - x > 0\}}$

$x \in \langle -\infty, 4\rangle$ $\rightsquigarrow$ rješenje nejednadžbe $4 - x > 0$ u skupu $\mathbb{R}$

$x \in [-1, 2]$ $\rightsquigarrow$ rješenje nejednadžbe $x^2 - x - 2 \leqslant 0$ u skupu $\mathbb{R}$

$$A = \{-1, 0, 1, 2\} \qquad B = \{1, 2, 3\}$$

$$A \cup B = \{-1, 0, 1, 2, 3\} \qquad A \cap B = \{1, 2\}$$

$$A \triangle B = \{-1, 0, 3\}$$

$$A \triangle B = (A \cup B) \setminus (A \cap B)$$

$$A \triangle B = (A \setminus B) \cup (B \setminus A)$$

osmi zadatak

Zadatak 8

Zadani su skupovi

$$A = \left\{x \in \mathbb{R} : \frac{2x+5}{x-1} \leqslant \frac{1}{2}\right\}$$

$$B = \left\{x \in \mathbb{R} : -8 \leqslant x < -6\right\}$$

$$C = \left\{x \in \mathbb{Z} : \left(\frac{2x+5}{x-1} \leqslant \frac{1}{2}\right) \wedge (x < 0)\right\}$$

$$D = \left\{x \in \mathbb{Z} : -8 \leqslant x < -6\right\}$$

Odredite elemente skupova A, B, C *i* D *te odredite skupove*

$$A \cap B,\ (A \cup B) \setminus D,\ \mathcal{P}(D),\ C \times D,\ D \times C,\ D^2.$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{}{2(x-1)}$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)\qquad\qquad\qquad}{2(x-1)}$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5) - \qquad\qquad}{2(x-1)}$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)}$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{}{2x-2}$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2}$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$3x + 11 = 0$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0$$

$$x=-\frac{11}{3}$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3}$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

$3x+11$		

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

$3x+11$		
$2x-2$		

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

$3x+11$		
$2x-2$		
$\frac{3x+11}{2x-2}$		

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$	
$3x+11$		
$2x-2$		
$\frac{3x+11}{2x-2}$		

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$	$+\infty$
$3x+11$		
$2x-2$		
$\frac{3x+11}{2x-2}$		

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$	$-\frac{11}{3}$	$+\infty$
$3x+11$			
$2x-2$			
$\frac{3x+11}{2x-2}$			

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$	$-\frac{11}{3}$	1	$+\infty$
$3x+11$				
$2x-2$				
$\frac{3x+11}{2x-2}$				

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$		$-\frac{11}{3}$		1		$+\infty$
$3x+11$		$-$					
$2x-2$							
$\frac{3x+11}{2x-2}$							

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$		$-\frac{11}{3}$		1		$+\infty$
$3x+11$		$-$		$+$			
$2x-2$							
$\frac{3x+11}{2x-2}$							

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$	$-\frac{11}{3}$	1	$+\infty$
$3x+11$	$-$	$+$	$+$	
$2x-2$				
$\frac{3x+11}{2x-2}$				

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$		$-\frac{11}{3}$		1		$+\infty$
$3x+11$		$-$		$+$		$+$	
$2x-2$		$-$					
$\frac{3x+11}{2x-2}$							

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$	$-\frac{11}{3}$	1	$+\infty$
$3x+11$	$-$	$+$	$+$	
$2x-2$	$-$	$-$		
$\frac{3x+11}{2x-2}$				

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$	$-\frac{11}{3}$	1	$+\infty$
$3x+11$	$-$	$+$	$+$	
$2x-2$	$-$	$-$	$+$	
$\frac{3x+11}{2x-2}$				

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$	$-\frac{11}{3}$	1	$+\infty$
$3x+11$	$-$	$+$	$+$	
$2x-2$	$-$	$-$	$+$	
$\frac{3x+11}{2x-2}$	$+$			

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$	$-\frac{11}{3}$	1	$+\infty$
$3x+11$	$-$	$+$	$+$	
$2x-2$	$-$	$-$	$+$	
$\frac{3x+11}{2x-2}$	$+$	$-$		

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$		$-\frac{11}{3}$		1		$+\infty$
$3x+11$		$-$		$+$		$+$	
$2x-2$		$-$		$-$		$+$	
$\frac{3x+11}{2x-2}$		$+$		$-$		$+$	

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$		$-\frac{11}{3}$		1		$+\infty$
$3x+11$		$-$		$+$		$+$	
$2x-2$		$-$		$-$		$+$	
$\frac{3x+11}{2x-2}$		$+$		$-$		$+$	

RJEŠENJE:

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

$-\infty \qquad -\frac{11}{3} \qquad 1 \qquad +\infty$

$3x+11$	$-$	$+$	$+$
$2x-2$	$-$	$-$	$+$
$\frac{3x+11}{2x-2}$	$+$	$\ominus$	$+$

RJEŠENJE:

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

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$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

$$-\infty \qquad -\frac{11}{3} \qquad 1 \qquad +\infty$$

$3x+11$	$-$	$+$	$+$
$2x-2$	$-$	$-$	$+$
$\frac{3x+11}{2x-2}$	$+$	$\ominus$	$+$

RJEŠENJE: $x \in \left[-\frac{11}{3}, 1\right\rangle$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$		$-\frac{11}{3}$		1		$+\infty$
$3x+11$		$-$		$+$		$+$	
$2x-2$		$-$		$-$		$+$	
$\frac{3x+11}{2x-2}$		$+$		$\ominus$		$+$	

RJEŠENJE: $x \in \left[-\frac{11}{3}, 1\right\rangle$

$A =$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} -$$

$$\frac{2(2x+5)-(}{2(x-1)}$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$		$-\frac{11}{3}$		1		$+\infty$
$3x+11$		$-$		$+$		$+$	
				$-$		$+$	
				$\ominus$		$+$	

$$A = \left\{ x \in \mathbb{R} : \frac{2x+5}{x-1} \leqslant \frac{1}{2} \right\}$$

RJEŠENJE: $x \in \left[-\frac{11}{3}, 1\right\rangle$

$A =$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} -$$

$$\frac{2(2x+5) - (}{2(x-1)}$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x + 11 = 0 \qquad 2x - 2 = 0$$

$$x = -\frac{11}{3} \qquad x = 1$$

	$-\infty$	$-\frac{11}{3}$	1	$+\infty$
$3x+11$	$-$	$+$	$+$	
		$-$	$+$	
		⊖	$+$	

$$A = \left\{ x \in \mathbb{R} : \frac{2x+5}{x-1} \leqslant \frac{1}{2} \right\}$$

RJEŠENJE: $x \in \left[-\frac{11}{3}, 1\right\rangle$

$$A = \left[-\frac{11}{3}, 1\right\rangle$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$3x + 11 = 0 \qquad 2x - 2 = 0$

$x = -\frac{11}{3} \qquad x = 1$

	$-\infty$	$-\frac{11}{3}$	1	$+\infty$
$3x+11$	$-$	$+$	$+$	
$2x-2$	$-$	$-$	$+$	
$\frac{3x+11}{2x-2}$	$+$	$\ominus$	$+$	

RJEŠENJE: $x \in \left[-\frac{11}{3}, 1\right\rangle$

$A = \left[-\frac{11}{3}, 1\right\rangle \qquad B =$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} -$$

$$\frac{2(2x+5)-(}{2(x-1)}$$

$$B = \{x \in \mathbb{R} : -8 \leqslant x < -6\}$$

	$-\infty$	$-\frac{11}{3}$	1	$+\infty$
$3x+11$	$-$	$+$	$+$	
		$-$	$+$	
		$\ominus$	$+$	

RJEŠENJE: $x \in \left[-\frac{11}{3}, 1\right\rangle$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$3x + 11 = 0$

$x = -\frac{11}{3}$

$2x - 2 = 0$

$x = 1$

$A = \left[-\frac{11}{3}, 1\right\rangle$

$B =$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} -$$

$$\frac{2(2x+5)-(}{2(x-1)}$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$	$-\frac{11}{3}$	1	$+\infty$
$3x+11$	$-$	$+$	$+$	
		$-$	$+$	
		$\ominus$	$+$	

$$B = \left\{x \in \mathbb{R} : -8 \leqslant x < -6\right\}$$

RJEŠENJE: $x \in \left[-\frac{11}{3}, 1\right\rangle$

$$A = \left[-\frac{11}{3}, 1\right\rangle \qquad B = [-8, -6\rangle$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$		$-\frac{11}{3}$		1		$+\infty$
$3x+11$		$-$		$+$		$+$	
$2x-2$		$-$		$-$		$+$	
$\frac{3x+11}{2x-2}$		$+$		$\ominus$		$+$	

RJEŠENJE: $x \in \left[-\frac{11}{3}, 1\right\rangle$

$$A = \left[-\frac{11}{3}, 1\right\rangle \qquad B = [-8, -6\rangle$$

$C =$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x +}{x -}$$

$$\frac{2(2x +}{2(x-1)}$$

	$-\infty$	$-\frac{11}{3}$	1	$+\infty$
$3x+11$	$-$	$+$	$+$	
			$+$	
			$+$	

$$C = \left\{x \in \mathbb{Z} : \left(\frac{2x+5}{x-1} \leqslant \frac{1}{2}\right) \wedge (x < 0)\right\}$$

RJEŠENJE: $x \in \left[-\frac{11}{3}, 1\right\rangle$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$3x + 11 = 0$ $\quad$ $2x - 2 = 0$

$x = -\frac{11}{3}$ $\quad$ $x = 1$

$A = \left[-\frac{11}{3}, 1\right\rangle$ $\quad$ $B = [-8, -6\rangle$

$C =$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x +}{x -}$$

$$\frac{2(2x +}{2(x-1)}$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$	$-\frac{11}{3}$	1	$+\infty$
$3x+11$	$-$	$+$	$+$	
			$+$	
			$+$	

$$C=\left\{x\in\mathbb{Z} : \left(\frac{2x+5}{x-1} \leqslant \frac{1}{2}\right) \wedge (x<0)\right\}$$

RJEŠENJE: $x \in \left[-\frac{11}{3}, 1\right\rangle$

$$A=\left[-\frac{11}{3}, 1\right\rangle \qquad B=[-8,-6\rangle$$

$$C=\{-3,-2,-1\}$$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

$$\begin{array}{c|ccccccc}
 & -\infty & & -\frac{11}{3} & & 1 & & +\infty \\
\hline
3x+11 & & - & & + & & + & \\
\hline
2x-2 & & - & & - & & + & \\
\hline
\frac{3x+11}{2x-2} & & + & & \ominus & & + &
\end{array}$$

RJEŠENJE: $x \in \left[-\frac{11}{3}, 1\right\rangle$

$A = \left[-\frac{11}{3}, 1\right\rangle \qquad B = [-8, -6\rangle$

$C = \{-3, -2, -1\} \qquad D =$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} -$$

$$D = \{x \in \mathbb{Z} : -8 \leqslant x < -6\}$$

$$\frac{2(2x+5) - (}{2(x-1)}$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$3x + 11 = 0$ $\qquad$ $2x - 2 = 0$

$x = -\frac{11}{3}$ $\qquad$ $x = 1$

$-\infty \qquad -\frac{11}{3} \qquad 1 \qquad +\infty$

$3x + 11$	$-$	$+$	$+$
		$-$	$+$
		$\ominus$	$+$

RJEŠENJE: $x \in \left[-\frac{11}{3}, 1\right\rangle$

$A = \left[-\frac{11}{3}, 1\right\rangle$ $\qquad$ $B = [-8, -6\rangle$

$C = \{-3, -2, -1\}$ $\qquad$ $D =$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} -$$

$$\frac{2(2x+5)-(}{2(x-1)}$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$-\infty$ $\quad -\frac{11}{3}$ $\quad 1$ $\quad +\infty$

$3x+11$	$-$	$+$	$+$
		$-$	$+$
		⊖	$+$

$$D = \{x \in \mathbb{Z} : -8 \leqslant x < -6\}$$

RJEŠENJE: $x \in \left[-\frac{11}{3}, 1\right\rangle$

$3x + 11 = 0$

$x = -\frac{11}{3}$

$2x - 2 = 0$

$x = 1$

$A = \left[-\frac{11}{3}, 1\right\rangle$ $\qquad B = [-8, -6\rangle$

$C = \{-3, -2, -1\}$ $\qquad D = \{-8, -7\}$

Rješenje

$$\frac{2x+5}{x-1} \leqslant \frac{1}{2}$$

$$\frac{2x+5}{x-1} - \frac{1}{2} \leqslant 0$$

$$\frac{2(2x+5)-(x-1)}{2(x-1)} \leqslant 0$$

$$\frac{3x+11}{2x-2} \leqslant 0$$

$$3x+11=0 \qquad 2x-2=0$$

$$x=-\frac{11}{3} \qquad x=1$$

	$-\infty$		$-\frac{11}{3}$		1		$+\infty$
$3x+11$		$-$		$+$		$+$	
$2x-2$		$-$		$-$		$+$	
$\frac{3x+11}{2x-2}$		$+$		$\ominus$		$+$	

RJEŠENJE: $x \in \left[-\frac{11}{3}, 1\right\rangle$

$$A = \left[-\frac{11}{3}, 1\right\rangle \qquad B = [-8, -6\rangle$$

$$C = \{-3, -2, -1\} \qquad D = \{-8, -7\}$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \ B = [-8, -6\rangle, \ C = \{-3, -2, -1\}, \ D = \{-8, -7\}$$

$$A \cap B =$$

$$A = \left[-\frac{11}{3}, 1\right\rangle,\ B = [-8, -6\rangle,\ C = \{-3, -2, -1\},\ D = \{-8, -7\}$$

$$A \cap B = \emptyset$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \ B = [-8, -6\rangle, \ C = \{-3, -2, -1\}, \ D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A = \left[-\frac{11}{3}, 1\right\rangle,\ B = [-8, -6\rangle,\ C = \{-3, -2, -1\},\ D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$A \cup B =$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \;\; B = [-8, -6\rangle, \;\; C = \{-3, -2, -1\}, \;\; D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow A$ i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \ B = [-8, -6\rangle, \ C = \{-3, -2, -1\}, \ D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$(A \cup B) \setminus D =$

$$A = \left[-\frac{11}{3}, 1\right\rangle,\ B = [-8,-6\rangle,\ C = \{-3,-2,-1\},\ D = \{-8,-7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8,-6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7 \rangle$$

$$A = \left[-\frac{11}{3}, 1\right\rangle,\ B = [-8, -6\rangle,\ C = \{-3, -2, -1\},\ D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow A$ i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \; B = [-8,-6\rangle, \; C = \{-3,-2,-1\}, \; D = \{-8,-7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8,-6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8,-7\rangle \cup \langle -7,-6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \ B = [-8, -6\rangle, \ C = \{-3, -2, -1\}, \ D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) =$$

$$A = \left[-\frac{11}{3}, 1\right\rangle,\ B = [-8, -6\rangle,\ C = \{-3, -2, -1\},\ D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow A$ i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset,$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \ B = [-8, -6\rangle, \ C = \{-3, -2, -1\}, \ D = \{-8, -7\}$$

$$A \cap B = \emptyset \leftsquigarrow A \text{ i } B \text{ su disjunktni skupovi}$$

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset, \{-8\},$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \; B = [-8, -6\rangle, \; C = \{-3, -2, -1\}, \; D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \Big\{\emptyset, \{-8\}, \{-7\},$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \; B = [-8, -6\rangle, \; C = \{-3, -2, -1\}, \; D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \Big\{\emptyset, \{-8\}, \{-7\}, D\Big\}$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \; B = [-8, -6\rangle, \; C = \{-3, -2, -1\}, \; D = \{-8, -7\}$$

$$A \cap B = \emptyset \leftsquigarrow A \text{ i } B \text{ su disjunktni skupovi}$$

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset, \{-8\}, \{-7\}, D\big\}$$

$$C \times D =$$

$$A=\left[-\frac{11}{3},1\right\rangle,\ B=[-8,-6\rangle,\ C=\{-3,-2,-1\},\ D=\{-8,-7\}$$

$$A\cap B=\emptyset \leftsquigarrow A \text{ i } B \text{ su disjunktni skupovi}$$

$$A\cup B=[-8,-6\rangle\cup\left[-\frac{11}{3},1\right\rangle$$

$$(A\cup B)\setminus D=\langle-8,-7\rangle\cup\langle-7,-6\rangle\cup\left[-\frac{11}{3},1\right\rangle$$

$$\mathcal{P}(D)=\Big\{\emptyset,\{-8\},\{-7\},D\Big\}$$

$$C\times D=\Big\{(-3,-8),$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \ B = [-8, -6\rangle, \ C = \{-3, -2, -1\}, \ D = \{-8, -7\}$$

$$A \cap B = \emptyset \leftsquigarrow A \text{ i } B \text{ su disjunktni skupovi}$$

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset, \{-8\}, \{-7\}, D\big\}$$

$$C \times D = \big\{(-3, -8), (-3, -7),$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \ B = [-8, -6\rangle, \ C = \{-3, -2, -1\}, \ D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset, \{-8\}, \{-7\}, D\big\}$$

$$C \times D = \big\{(-3, -8), (-3, -7), (-2, -8),$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \ B = [-8, -6\rangle, \ C = \{-3, -2, -1\}, \ D = \{-8, -7\}$$

$$A \cap B = \emptyset \leftsquigarrow A \text{ i } B \text{ su disjunktni skupovi}$$

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset, \{-8\}, \{-7\}, D\big\}$$

$$\begin{aligned} C \times D = \big\{&(-3, -8), (-3, -7), (-2, -8), \\ &(-2, -7), \end{aligned}$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \; B = [-8, -6\rangle, \; C = \{-3, -2, -1\}, \; D = \{-8, -7\}$$

$$A \cap B = \emptyset \leftsquigarrow A \text{ i } B \text{ su disjunktni skupovi}$$

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset, \{-8\}, \{-7\}, D\big\}$$

$$C \times D = \big\{(-3, -8), (-3, -7), (-2, -8), \\ (-2, -7), (-1, -8),$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \;\; B = [-8, -6\rangle, \;\; C = \{-3, -2, -1\}, \;\; D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset, \{-8\}, \{-7\}, D\big\}$$

$$\begin{aligned} C \times D = \big\{&(-3,-8), (-3,-7), (-2,-8), \\ &(-2,-7), (-1,-8), (-1,-7)\big\} \end{aligned}$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \ B = [-8, -6\rangle, \ C = \{-3, -2, -1\}, \ D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset, \{-8\}, \{-7\}, D\big\}$$

$$\begin{aligned} C \times D = \big\{&(-3, -8), (-3, -7), (-2, -8), \\ &(-2, -7), (-1, -8), (-1, -7)\big\} \end{aligned}$$

$$D \times C =$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \ B = [-8, -6\rangle, \ C = \{-3, -2, -1\}, \ D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset, \{-8\}, \{-7\}, D\big\}$$

$$C \times D = \big\{(-3, -8), (-3, -7), (-2, -8),$$
$$(-2, -7), (-1, -8), (-1, -7)\big\}$$

$$D \times C = \big\{(-8, -3),$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \;\; B = [-8, -6\rangle, \;\; C = \{-3, -2, -1\}, \;\; D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow A$ i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset, \{-8\}, \{-7\}, D\big\}$$

$$\begin{aligned} C \times D = \big\{&(-3, -8), (-3, -7), (-2, -8), \\ &(-2, -7), (-1, -8), (-1, -7)\big\} \end{aligned}$$

$$D \times C = \big\{(-8, -3), (-8, -2),$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \;\; B = [-8, -6\rangle, \;\; C = \{-3, -2, -1\}, \;\; D = \{-8, -7\}$$

$$A \cap B = \emptyset \;\; \leftsquigarrow \;\; A \text{ i } B \text{ su disjunktni skupovi}$$

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset, \{-8\}, \{-7\}, D\big\}$$

$$\begin{aligned} C \times D = \big\{&(-3,-8),(-3,-7),(-2,-8),\\ &(-2,-7),(-1,-8),(-1,-7)\big\} \end{aligned}$$

$$D \times C = \big\{(-8,-3),(-8,-2),(-8,-1),$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \ B = [-8, -6\rangle, \ C = \{-3, -2, -1\}, \ D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow A$ i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset, \{-8\}, \{-7\}, D\big\}$$

$$\begin{aligned} C \times D = \big\{&(-3, -8), (-3, -7), (-2, -8), \\ &(-2, -7), (-1, -8), (-1, -7)\big\} \end{aligned}$$

$$\begin{aligned} D \times C = \big\{&(-8, -3), (-8, -2), (-8, -1), \\ &(-7, -3), \end{aligned}$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \ B = [-8, -6\rangle, \ C = \{-3, -2, -1\}, \ D = \{-8, -7\}$$

$$A \cap B = \emptyset \leftsquigarrow A \text{ i } B \text{ su disjunktni skupovi}$$

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset, \{-8\}, \{-7\}, D\big\}$$

$$\begin{aligned} C \times D = \big\{&(-3, -8), (-3, -7), (-2, -8), \\ &(-2, -7), (-1, -8), (-1, -7)\big\} \end{aligned}$$

$$\begin{aligned} D \times C = \big\{&(-8, -3), (-8, -2), (-8, -1), \\ &(-7, -3), (-7, -2), \end{aligned}$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \ B = [-8, -6\rangle, \ C = \{-3, -2, -1\}, \ D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \Big\{\emptyset, \{-8\}, \{-7\}, D\Big\}$$

$$\begin{aligned} C \times D = \Big\{&(-3,-8),(-3,-7),(-2,-8),\\ &(-2,-7),(-1,-8),(-1,-7)\Big\}\end{aligned}$$

$$\begin{aligned} D \times C = \Big\{&(-8,-3),(-8,-2),(-8,-1),\\ &(-7,-3),(-7,-2),(-7,-1)\Big\}\end{aligned}$$

$$A = \left[-\frac{11}{3}, 1\right\rangle,\ B = [-8, -6\rangle,\ C = \{-3, -2, -1\},\ D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \{\emptyset, \{-8\}, \{-7\}, D\}$$

$$C \times D \neq D \times C$$

$$\begin{aligned} C \times D = \{&(-3, -8), (-3, -7), (-2, -8), \\ &(-2, -7), (-1, -8), (-1, -7)\} \end{aligned}$$

$$\begin{aligned} D \times C = \{&(-8, -3), (-8, -2), (-8, -1), \\ &(-7, -3), (-7, -2), (-7, -1)\} \end{aligned}$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \;\; B = [-8, -6\rangle, \;\; C = \{-3, -2, -1\}, \;\; D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset, \{-8\}, \{-7\}, D\big\}$$

$$\boxed{C \times D \neq D \times C}$$

$$C \times D = \big\{(-3, -8), (-3, -7), (-2, -8), (-2, -7), (-1, -8), (-1, -7)\big\}$$

$$D \times C = \big\{(-8, -3), (-8, -2), (-8, -1), (-7, -3), (-7, -2), (-7, -1)\big\}$$

$$D^2 =$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \ B = [-8, -6\rangle, \ C = \{-3, -2, -1\}, \ D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\boxed{D^2 = D \times D}$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \{\emptyset, \{-8\}, \{-7\}, D\}$$

$$\boxed{C \times D \neq D \times C}$$

$$C \times D = \{(-3, -8), (-3, -7), (-2, -8), \\ (-2, -7), (-1, -8), (-1, -7)\}$$

$$D \times C = \{(-8, -3), (-8, -2), (-8, -1), \\ (-7, -3), (-7, -2), (-7, -1)\}$$

$$D^2 =$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \ B = [-8, -6\rangle, \ C = \{-3, -2, -1\}, \ D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\boxed{D^2 = D \times D}$$

$$(A \cup B) \setminus D = \langle -8, -7\rangle \cup \langle -7, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\mathcal{P}(D) = \big\{\emptyset, \{-8\}, \{-7\}, D\big\}$$

$$\boxed{C \times D \neq D \times C}$$

$$\begin{aligned} C \times D = \big\{&(-3, -8), (-3, -7), (-2, -8), \\ &(-2, -7), (-1, -8), (-1, -7)\big\} \end{aligned}$$

$$\begin{aligned} D \times C = \big\{&(-8, -3), (-8, -2), (-8, -1), \\ &(-7, -3), (-7, -2), (-7, -1)\big\} \end{aligned}$$

$$D^2 = \big\{(-8, -8),$$

$$A = \left[-\frac{11}{3}, 1\right\rangle,\ B = [-8, -6\rangle,\ C = \{-3, -2, -1\},\ D = \{-8, -7\}$$

$A \cap B = \emptyset \leftsquigarrow$ A i B su disjunktni skupovi

$$A \cup B = [-8, -6\rangle \cup \left[-\frac{11}{3}, 1\right\rangle$$

$$\boxed{D^2 = D \times D}$$

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$$D^2 = \{(-8, -8), (-8, -7),$$

$$A = \left[-\frac{11}{3}, 1\right\rangle, \;\; B = [-8, -6\rangle, \;\; C = \{-3, -2, -1\}, \;\; D = \{-8, -7\}$$

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Nekoliko kratkih primjera i napomena

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$$A = \left\{x \in \mathbb{R} : x^2 + 3 = 0\right\} \qquad B = \left\{x \in \mathbb{C} : x^2 + 3 = 0\right\}$$

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$$x^2 = -3$$

$$x_1 = i\sqrt{3}, \quad x_2 = -i\sqrt{3}$$

$$A = \emptyset$$

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$$k(A) = 0$$

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$$x^2 + 3 = 0$$

$$x^2 = -3$$

$$x_1 = i\sqrt{3}, \quad x_2 = -i\sqrt{3}$$

$$A = \emptyset \qquad B = \left\{i\sqrt{3}, -i\sqrt{3}\right\}$$

$$k(A) = 0 \qquad k(B) = 2$$

$$C_1 = \left\{x \in \mathbb{R} : x^2 - 2x + 1 \leqslant 0\right\} \qquad C_2 = \left\{x \in \mathbb{R} : x^2 - 2x + 1 < 0\right\}$$

$$C_3 = \left\{x \in \mathbb{R} : x^2 - 2x + 1 \geqslant 0\right\} \qquad C_4 = \left\{x \in \mathbb{R} : x^2 - 2x + 1 > 0\right\}$$

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$$x^2 - 2x + 1 = 0$$

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$$x^2 - 2x + 1 = 0$$

$$x_{1,2} = \frac{-(-2) \pm \sqrt{(-2)^2 - 4 \cdot 1 \cdot 1}}{2 \cdot 1}$$

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$$x_1 = x_2 = 1$$

$$C_1 = \left\{x \in \mathbb{R} : x^2 - 2x + 1 \leqslant 0\right\} \qquad C_2 = \left\{x \in \mathbb{R} : x^2 - 2x + 1 < 0\right\}$$

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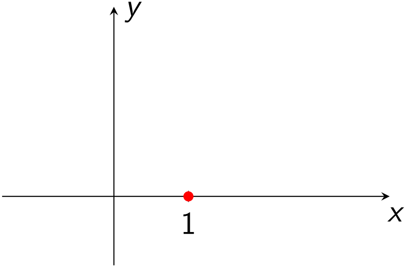

$$C_1 = \left\{x \in \mathbb{R} : x^2 - 2x + 1 \leqslant 0\right\} \qquad C_2 = \left\{x \in \mathbb{R} : x^2 - 2x + 1 < 0\right\}$$

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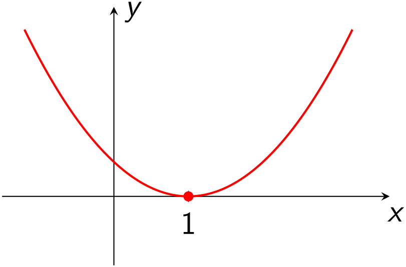

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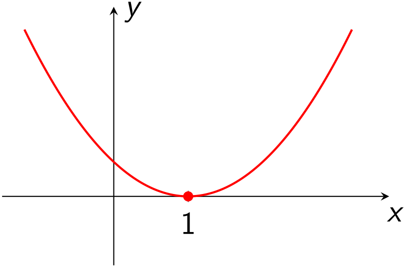

$$C_1 = \{1\}$$

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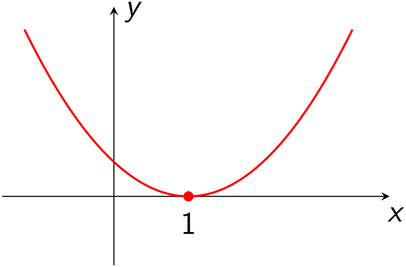

$$C_1 = \{1\}, \quad C_2 = \emptyset$$

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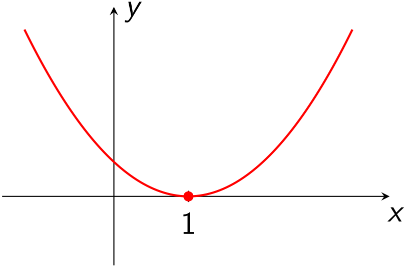

$$C_1 = \{1\}, \quad C_2 = \emptyset, \quad C_3 = \mathbb{R}$$

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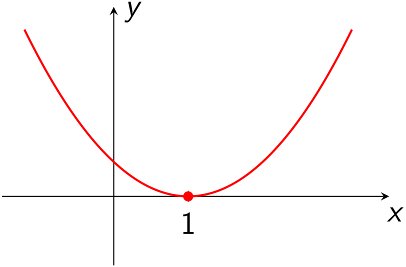

$$C_1 = \{1\}, \quad C_2 = \emptyset, \quad C_3 = \mathbb{R}, \quad C_4 = \mathbb{R} \setminus \{1\}$$

$D_1 = \left\{x \in \mathbb{R} : -x^2 + x - 1 \leqslant 0\right\} \qquad D_2 = \left\{x \in \mathbb{Z} : -x^2 + x - 1 < 0\right\}$

$D_3 = \left\{x \in \mathbb{R} : -x^2 + x - 1 \geqslant 0\right\} \qquad D_4 = \left\{x \in \mathbb{R} : -x^2 + x - 1 > 0\right\}$

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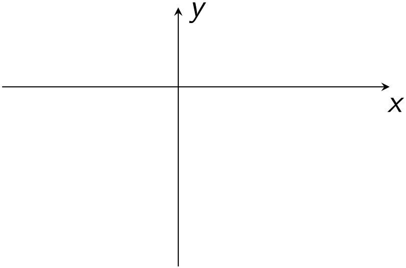

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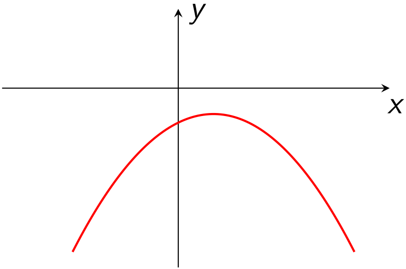

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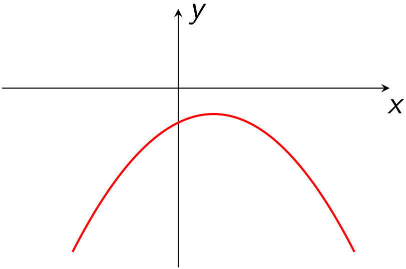
$$D_1 = \mathbb{R}$$



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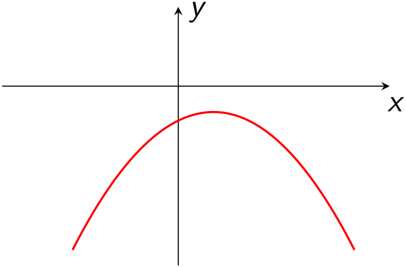

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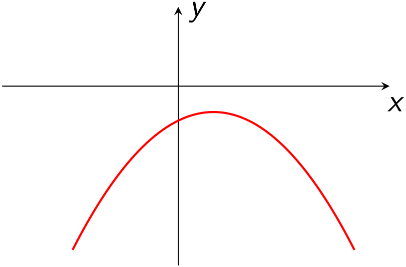

$$D_1 = \mathbb{R}, \quad D_2 = \mathbb{Z}, \quad D_3 = \emptyset$$

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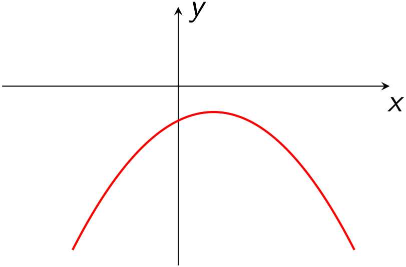
$$-x^2 + x - 1 = 0$$

$$x_{1,2} = \frac{-1 \pm \sqrt{1^2 - 4 \cdot (-1) \cdot (-1)}}{2 \cdot (-1)}$$

$$x_{1,2} = \frac{-1 \pm \sqrt{-3}}{-2} = \frac{-1 \pm i\sqrt{3}}{-2}$$



$$D_1 = \mathbb{R}, \quad D_2 = \mathbb{Z}, \quad D_3 = \emptyset, \quad D_4 = \emptyset$$