Inverzna funkcija. Nizovi realnih brojeva

Matematika za ekonomiste 1

Damir Horvat

FOI, Varaždin

Sadržaj

prvi zadatak

Zadatak 1

Odredite nultočke funkcija

$f(x) = 2^{5-x} + 50 \;\; i \;\; g(x) = 2^{5-x} - 50.$

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$f(x) = 2^{5-x} + 50$ *i* $g(x) = 2^{5-x} - 50.$

Rješenje

$\boxed{\text{nultočke od } f}$

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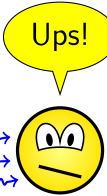

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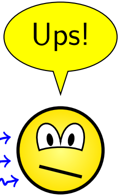
$$\begin{aligned} 2^{5-x} + 50 &= 0 \\ 2^{5-x} &= -50 \\ 5 - x &= \log_2(-50) \end{aligned}$$



funkcija f nema nultočki

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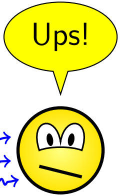

funkcija f nema nultočki

nultočke od g

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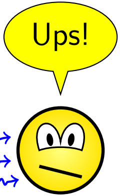

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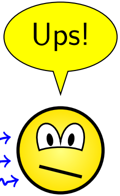

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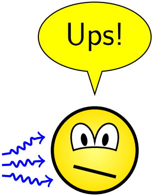

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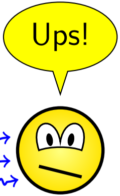

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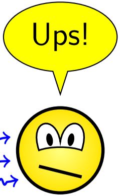

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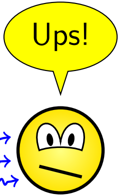

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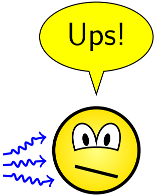

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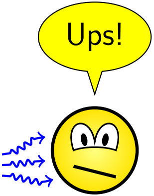

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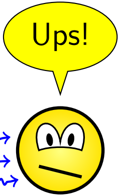

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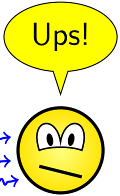

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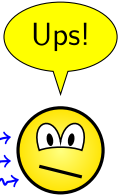

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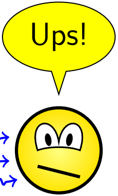

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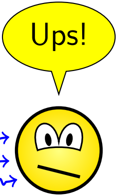

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egzaktna vrijednost nultočke

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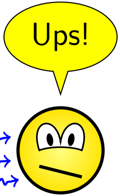

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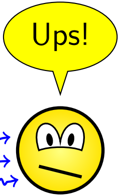

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egzaktna vrijednost nultočke

$$\boxed{x = 5 - \log_2 50}$$

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aproksimacija nultočke na 5 decimala

$$\boxed{x \approx -0.64386}$$

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2. način

$$a^x = b \rightsquigarrow x = \log_a b$$

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$$\log 2^{5-x}$$

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1. način

$$2^{5-x} - 50 = 0$$

$$2^{5-x} = 50$$

$$5 - x = \log_2 50$$

$$-x = -5 + \log_2 50 \,/\cdot(-1)$$

$$x = 5 - \log_2 50$$

$$x = 5 - \frac{\log 50}{\log 2}$$

$$x \approx -0.64386$$

2. način

$$2^{5-x} - 50 = 0$$

$$2^{5-x} = 50 \,/\, \log$$

$$\log 2^{5-x} =$$

$$a^x = b \rightsquigarrow x = \log_a b$$

Nultočke funkcije g

1. način

$$2^{5-x} - 50 = 0$$

$$2^{5-x} = 50$$

$$5 - x = \log_2 50$$

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$$x \approx -0.64386$$

2. način

$$2^{5-x} - 50 = 0$$

$$2^{5-x} = 50 \,/\log$$

$$\log 2^{5-x} = \log 50$$

$$a^x = b \rightsquigarrow x = \log_a b$$

Nultočke funkcije g

$\boxed{\text{1. način}}$

$$2^{5-x} - 50 = 0$$

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$$5 - x = \log_2 50$$

$$-x = -5 + \log_2 50 \ \big/ \cdot (-1)$$

$$x = 5 - \log_2 50$$

$$x = 5 - \frac{\log 50}{\log 2}$$

$$x \approx -0.64386$$

$\boxed{\text{2. način}}$

$$2^{5-x} - 50 = 0$$

$$2^{5-x} = 50 \ \big/ \log$$

$$\log 2^{5-x} = \log 50$$

$$(5 - x) \log 2$$

$$a^x = b \rightsquigarrow x = \log_a b$$

$$\log_a x^k = k \cdot \log_a x$$

Nultočke funkcije g

1. način

$$2^{5-x} - 50 = 0$$

$$2^{5-x} = 50$$

$$5 - x = \log_2 50$$

$$-x = -5 + \log_2 50 \;/\cdot(-1)$$

$$x = 5 - \log_2 50$$

$$x = 5 - \frac{\log 50}{\log 2}$$

$$x \approx -0.64386$$

2. način

$$2^{5-x} - 50 = 0$$

$$2^{5-x} = 50 \;/\log$$

$$\log 2^{5-x} = \log 50$$

$$(5-x)\log 2 =$$

$$a^x = b \rightsquigarrow x = \log_a b$$

$$\log_a x^k = k \cdot \log_a x$$

Nultočke funkcije g

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$$2^{5-x} - 50 = 0$$

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2. način

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$$2^{5-x} = 50 \;/\log$$

$$\log 2^{5-x} = \log 50$$

$$(5 - x)\log 2 = \log 50$$

$$a^x = b \rightsquigarrow x = \log_a b$$

$$\log_a x^k = k \cdot \log_a x$$

Nultočke funkcije g

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2. način

$$2^{5-x} - 50 = 0$$

$$2^{5-x} = 50 \,/\log$$

$$\log 2^{5-x} = \log 50$$

$$(5 - x)\log 2 = \log 50 \,/ : \log 2$$

$$a^x = b \rightsquigarrow x = \log_a b$$

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Nultočke funkcije g

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2. način

$$2^{5-x} - 50 = 0$$

$$2^{5-x} = 50 \;/ \log$$

$$\log 2^{5-x} = \log 50$$

$$(5-x)\log 2 = \log 50 \;/ : \log 2$$

$$5 - x =$$

$$a^x = b \rightsquigarrow x = \log_a b$$

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Nultočke funkcije g

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$$x \approx -0.64386$$

$$\boxed{a^x = b \rightsquigarrow x = \log_a b}$$

2. način

$$2^{5-x} - 50 = 0$$

$$2^{5-x} = 50 \,/ \log$$

$$\log 2^{5-x} = \log 50$$

$$(5 - x)\log 2 = \log 50 \,/ : \log 2$$

$$5 - x = \frac{\log 50}{\log 2}$$

$$\boxed{\log_a x^k = k \cdot \log_a x}$$

Nultočke funkcije g

1. način

$$2^{5-x} - 50 = 0$$

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2. način

$$2^{5-x} - 50 = 0$$

$$2^{5-x} = 50 \,/\, \log$$

$$\log 2^{5-x} = \log 50$$

$$(5-x)\log 2 = \log 50 \,/:\log 2$$

$$5 - x = \frac{\log 50}{\log 2}$$

$$-x =$$

$$a^x = b \rightsquigarrow x = \log_a b$$

$$\log_a x^k = k \cdot \log_a x$$

Nultočke funkcije g

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2. način

$$2^{5-x} - 50 = 0$$

$$2^{5-x} = 50 \;/\log$$

$$\log 2^{5-x} = \log 50$$

$$(5-x)\log 2 = \log 50 \;/:\log 2$$

$$5 - x = \frac{\log 50}{\log 2}$$

$$-x = -5 + \frac{\log 50}{\log 2}$$

$$a^x = b \rightsquigarrow x = \log_a b$$

$$\log_a x^k = k \cdot \log_a x$$

Nultočke funkcije g

1. način

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$$2^{5-x} = 50$$
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2. način

$$2^{5-x} - 50 = 0$$
$$2^{5-x} = 50 \;/\log$$
$$\log 2^{5-x} = \log 50$$
$$(5-x)\log 2 = \log 50 \;/: \log 2$$
$$5 - x = \frac{\log 50}{\log 2}$$
$$-x = -5 + \frac{\log 50}{\log 2} \;/\cdot(-1)$$

$$a^x = b \rightsquigarrow x = \log_a b$$

$$\log_a x^k = k \cdot \log_a x$$

Nultočke funkcije g

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2. način

$$2^{5-x} - 50 = 0$$

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$$\log 2^{5-x} = \log 50$$

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$$5 - x = \frac{\log 50}{\log 2}$$

$$-x = -5 + \frac{\log 50}{\log 2} \;/\cdot(-1)$$

$$x = 5 - \frac{\log 50}{\log 2}$$

$$a^x = b \rightsquigarrow x = \log_a b$$

$$\log_a x^k = k \cdot \log_a x$$

Nultočke funkcije g

1. način

$$2^{5-x} - 50 = 0$$

$$2^{5-x} = 50 \; / \log_2$$

$$5 - x = \log_2 50$$

$$-x = -5 + \log_2 50 \; / \cdot (-1)$$

$$x = 5 - \log_2 50$$

$$x = 5 - \frac{\log 50}{\log 2}$$

$$x \approx -0.64386$$

2. način

$$2^{5-x} - 50 = 0$$

$$2^{5-x} = 50 \; / \log$$

$$\log 2^{5-x} = \log 50$$

$$(5 - x) \log 2 = \log 50 \; / : \log 2$$

$$5 - x = \frac{\log 50}{\log 2}$$

$$-x = -5 + \frac{\log 50}{\log 2} \; / \cdot (-1)$$

$$x = 5 - \frac{\log 50}{\log 2}$$

$$a^x = b \rightsquigarrow x = \log_a b$$

$$\log_a x^k = k \cdot \log_a x$$

drugi zadatak

Zadatak 2

Zadane su funkcije $f(x) = \log_2 x$ *i* $g(x) = \log_3 x$.

a) *Na kojim dijelovima domena vrijedi nejednakost* $f(x) \geqslant g(x)$?

b) *Na kojim dijelovima domena vrijedi nejednakost* $f(x) \leqslant g(x)$?

c) *Na kojem dijelu domene vrijedi* $1 \leqslant f(x) \leqslant 2$?

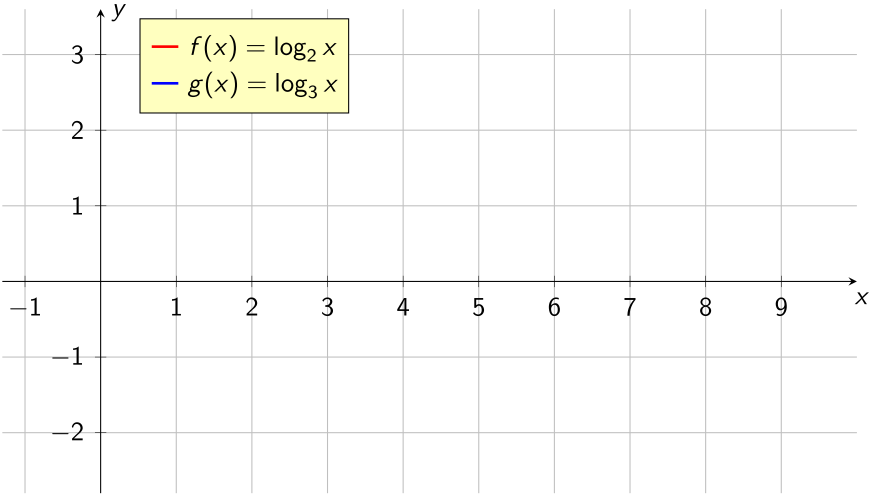
d) *Na kojem dijelu domene vrijedi* $1 \leqslant g(x) \leqslant 2$?

e) *Na kojim dijelovima domena vrijedi nejednakost* $f^{-1}(x) \geqslant g^{-1}(x)$?

f) *Na kojim dijelovima domena vrijedi nejednakost* $f^{-1}(x) \leqslant g^{-1}(x)$?

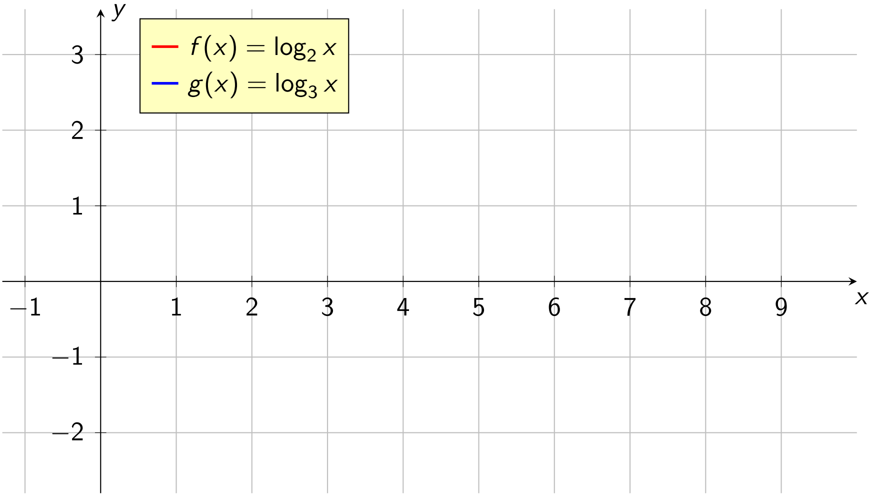
g) *Usporedite funkcije* f, g, f^{-1} *i* g^{-1} *na intervalu* $\langle 0, +\infty \rangle$ *s linearnom funkcijom* $h(x) = x$.

Rješenje

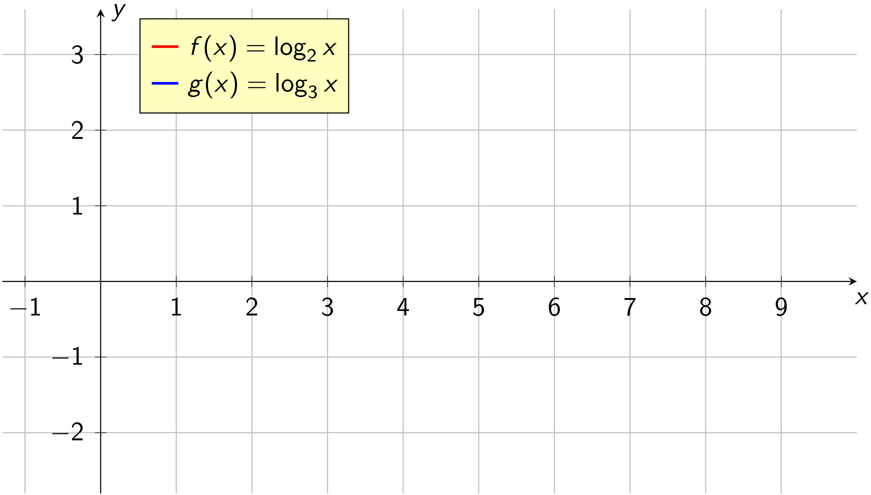


Rješenje

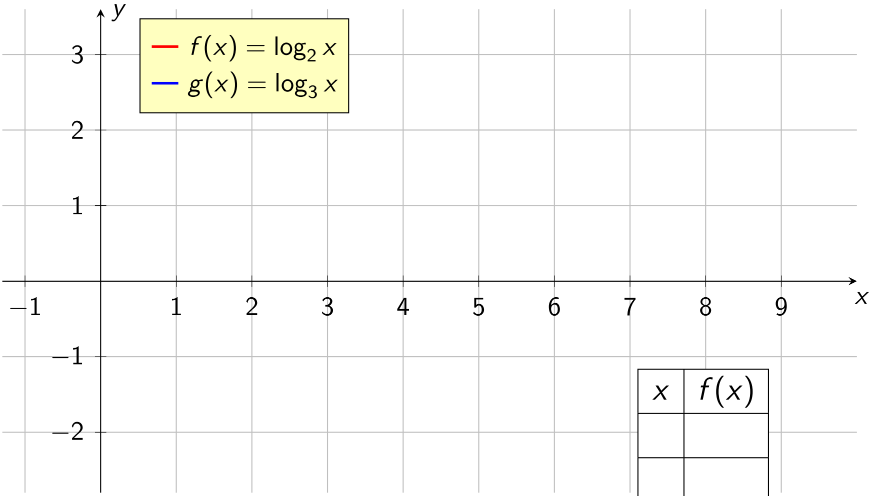
$f : \langle 0, +\infty \rangle \to \mathbb{R}$



Rješenje $f : \langle 0, +\infty\rangle \to \mathbb{R}$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$



Rješenje $\quad f : \langle 0, +\infty \rangle \to \mathbb{R} \qquad g : \langle 0, +\infty \rangle \to \mathbb{R}$

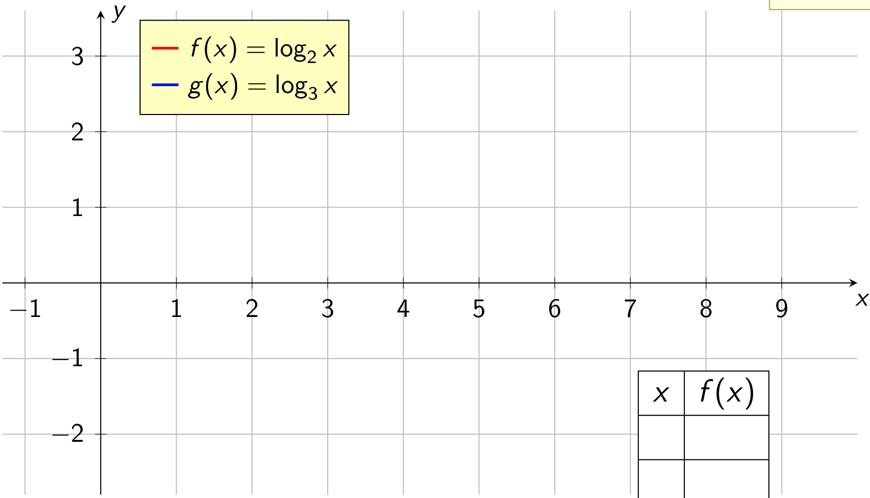


x	$f(x)$

Rješenje

$f : \langle 0, +\infty \rangle \to \mathbb{R}$ $\quad$ $g : \langle 0, +\infty \rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$

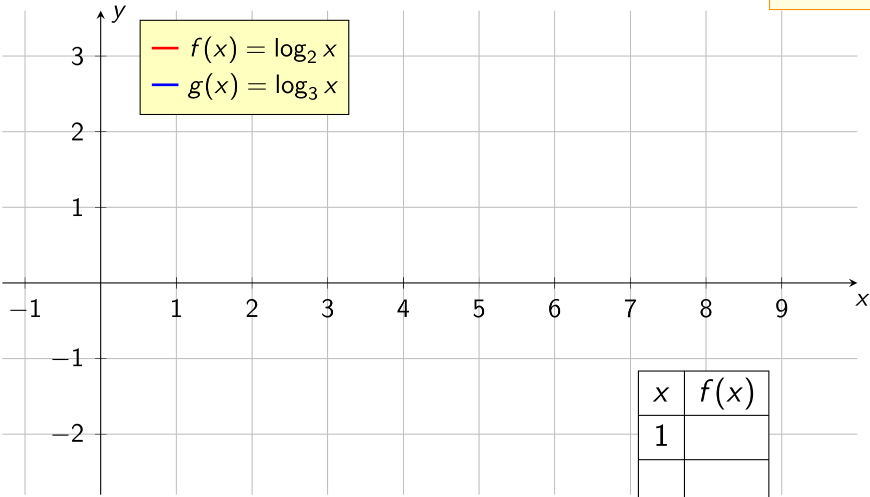


x	$f(x)$

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\qquad g : \langle 0, +\infty\rangle \to \mathbb{R}$

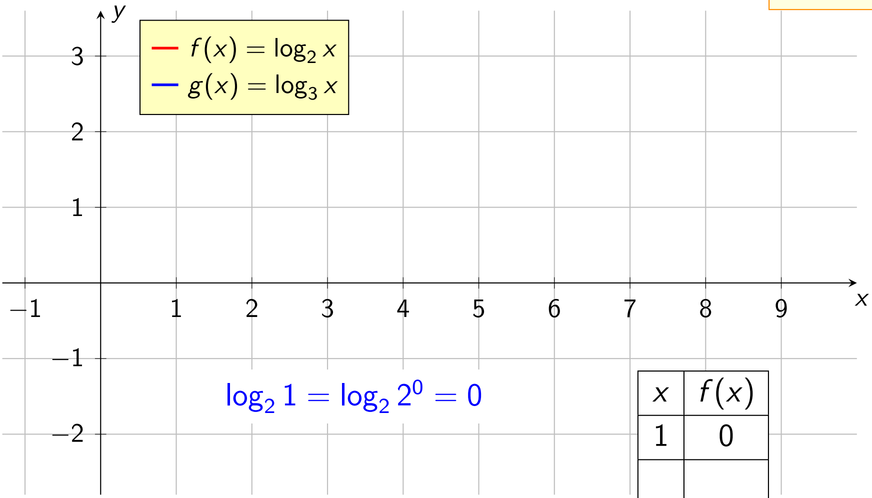
$\boxed{\log_a a^x = x}$



x	$f(x)$
1	

Rješenje $f : \langle 0, +\infty\rangle \to \mathbb{R}$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$

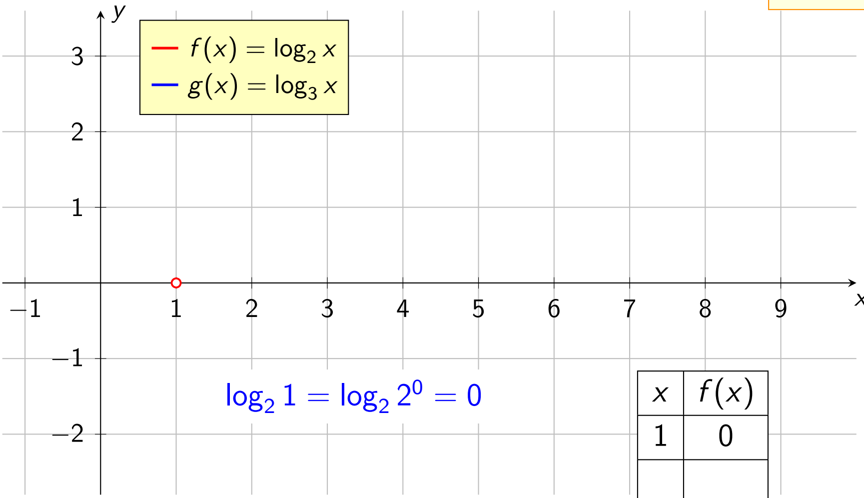


$$\log_2 1 = \log_2 2^0 = 0$$

x	$f(x)$
1	0

Rješenje $f : \langle 0, +\infty\rangle \to \mathbb{R}$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$$\log_a a^x = x$$

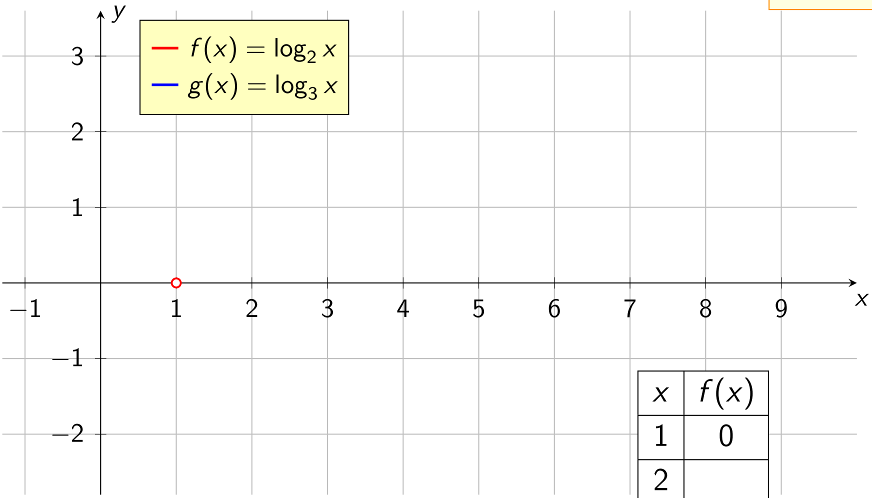


$$\log_2 1 = \log_2 2^0 = 0$$

x	$f(x)$
1	0

Rješenje $f : \langle 0, +\infty\rangle \to \mathbb{R}$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

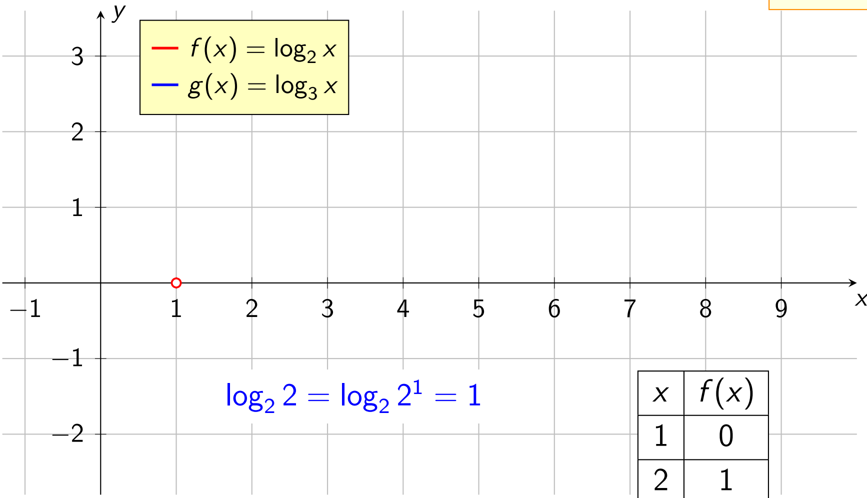
$\boxed{\log_a a^x = x}$



x	$f(x)$
1	0
2	

Rješenje $f:\langle 0,+\infty\rangle \to \mathbb{R}$ $g:\langle 0,+\infty\rangle \to \mathbb{R}$

$$\boxed{\log_a a^x = x}$$

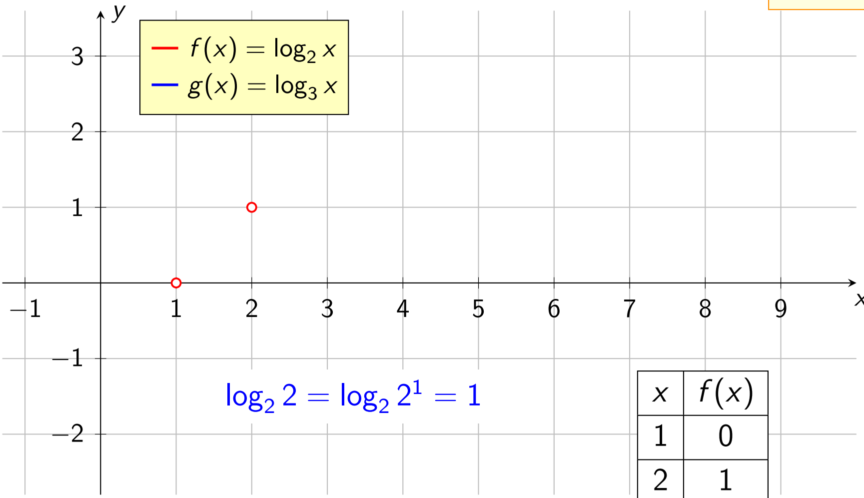


$$\log_2 2 = \log_2 2^1 = 1$$

x	$f(x)$
1	0
2	1

Rješenje $f : \langle 0, +\infty\rangle \to \mathbb{R}$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$$\boxed{\log_a a^x = x}$$

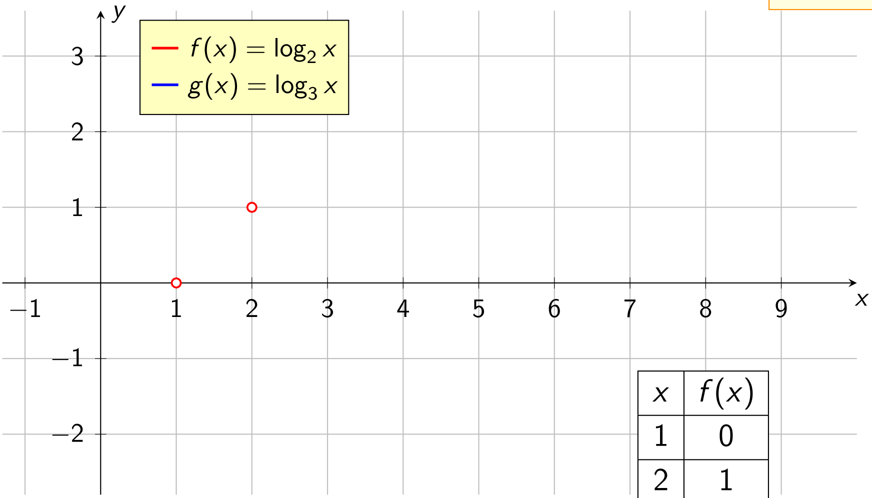


$$\log_2 2 = \log_2 2^1 = 1$$

x	$f(x)$
1	0
2	1

Rješenje $f : \langle 0, +\infty\rangle \to \mathbb{R}$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\log_a a^x = x$

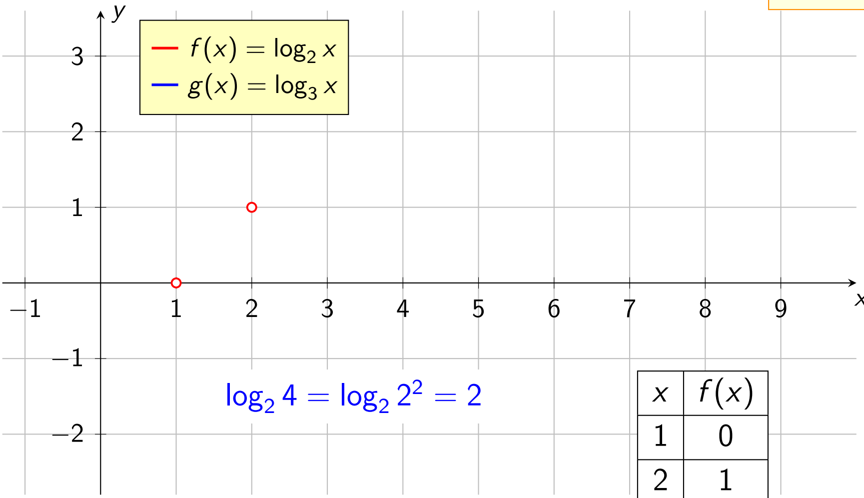


x	$f(x)$
1	0
2	1
4	

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\quad g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



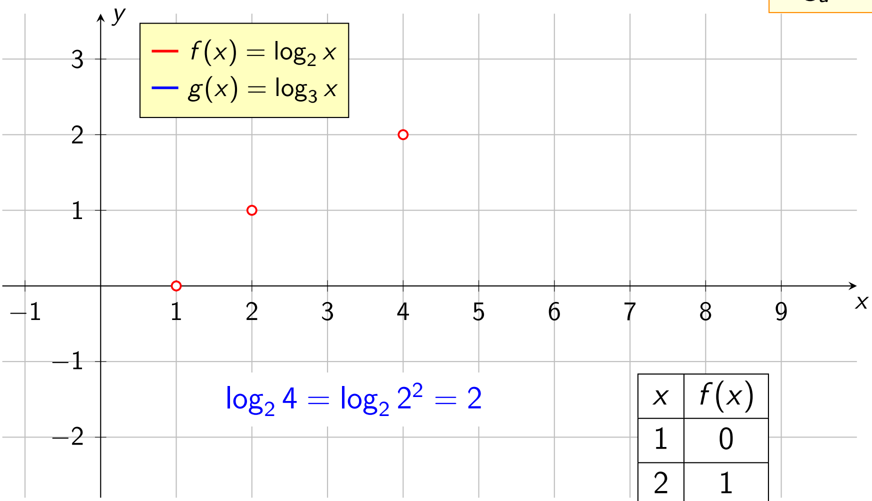
$\log_2 4 = \log_2 2^2 = 2$

x	$f(x)$
1	0
2	1
4	2

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\qquad$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$$\boxed{\log_a a^x = x}$$

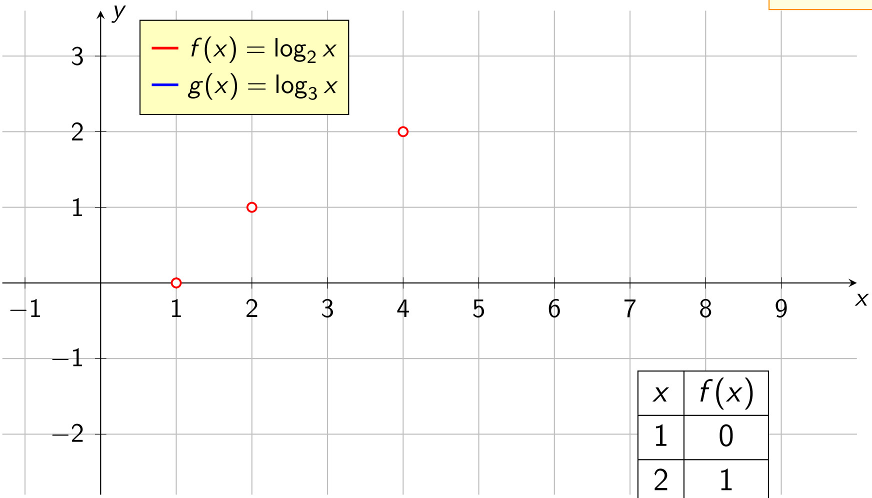


x	$f(x)$
1	0
2	1
4	2

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\quad g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$

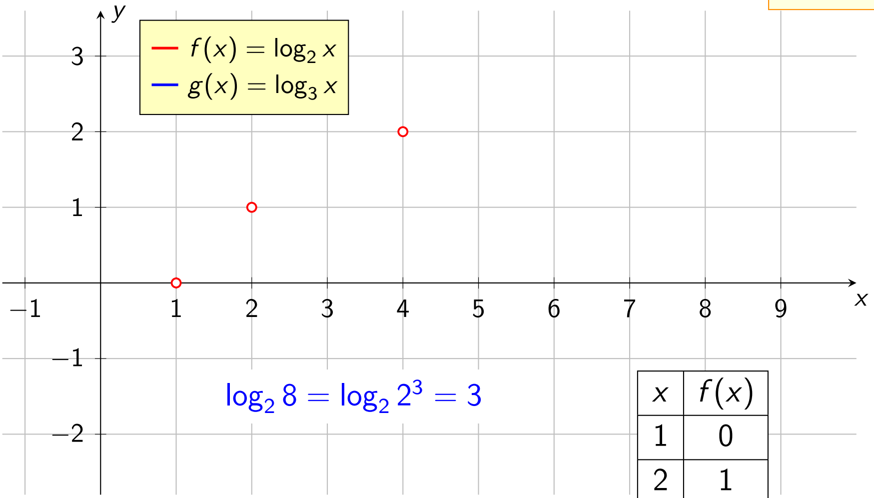


x	$f(x)$
1	0
2	1
4	2
8	

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\quad$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$

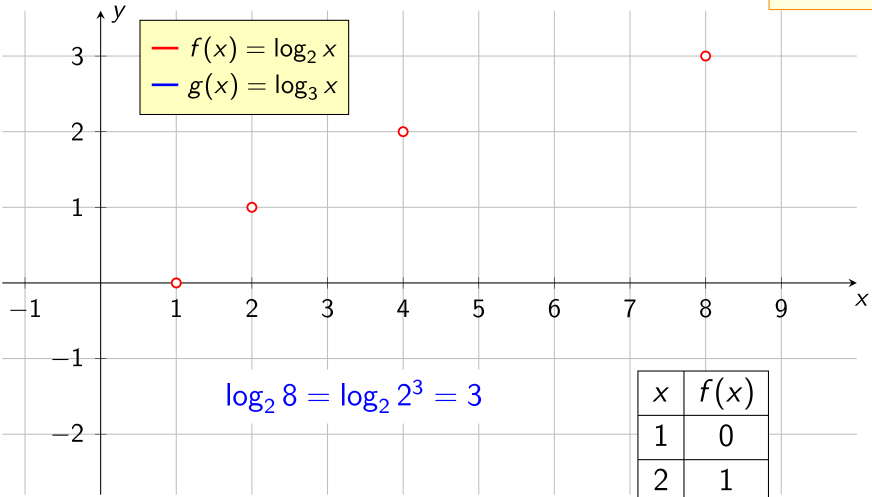


$\log_2 8 = \log_2 2^3 = 3$

x	$f(x)$
1	0
2	1
4	2
8	3

Rješenje $f : \langle 0, +\infty\rangle \to \mathbb{R}$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



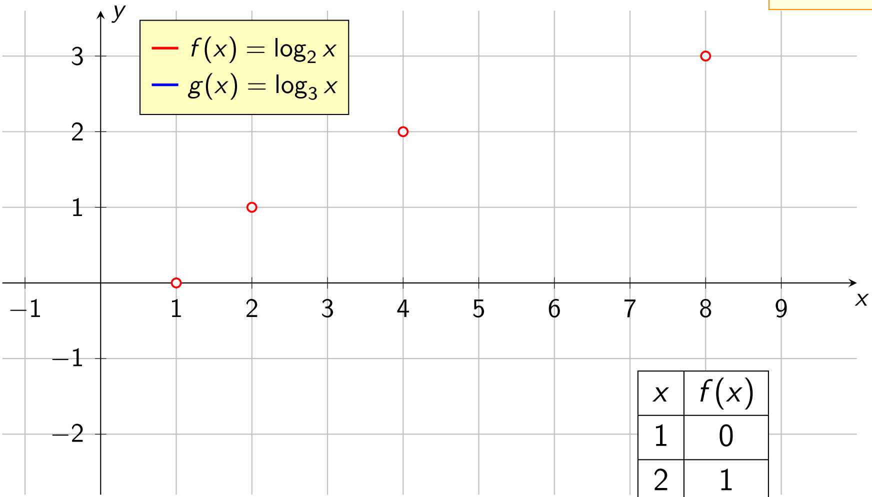
$\log_2 8 = \log_2 2^3 = 3$

x	$f(x)$
1	0
2	1
4	2
8	3

Rješenje

$f : \langle 0, +\infty \rangle \to \mathbb{R}$ $\qquad$ $g : \langle 0, +\infty \rangle \to \mathbb{R}$

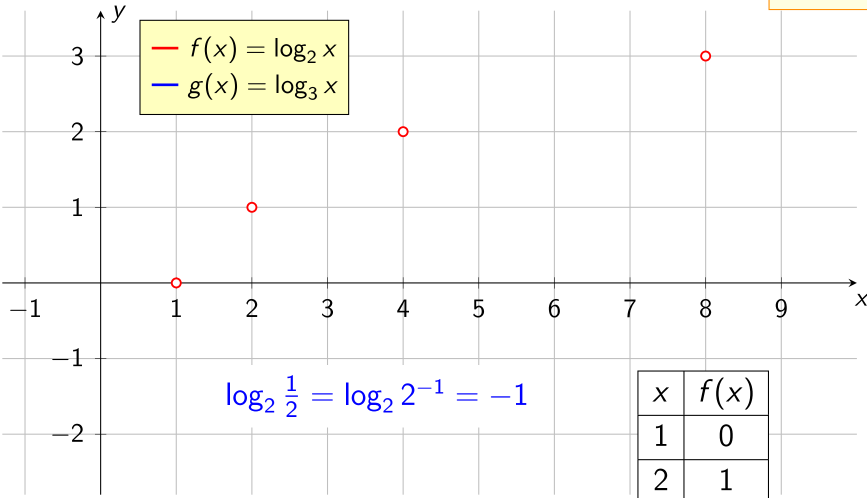
$$\boxed{\log_a a^x = x}$$



x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	

Rješenje $f : \langle 0, +\infty \rangle \to \mathbb{R}$ $g : \langle 0, +\infty \rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$

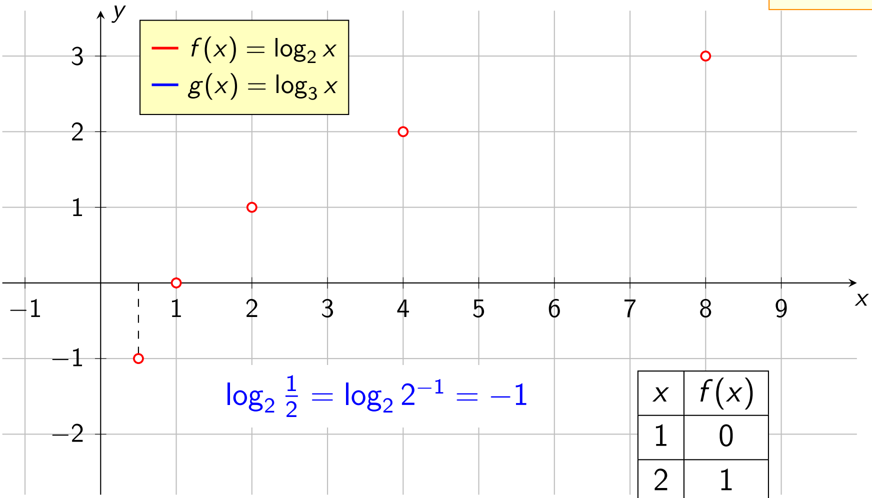


$$\log_2 \frac{1}{2} = \log_2 2^{-1} = -1$$

x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

Rješenje $f:\langle 0,+\infty\rangle \to \mathbb{R}$ $g:\langle 0,+\infty\rangle \to \mathbb{R}$

$$\log_a a^x = x$$

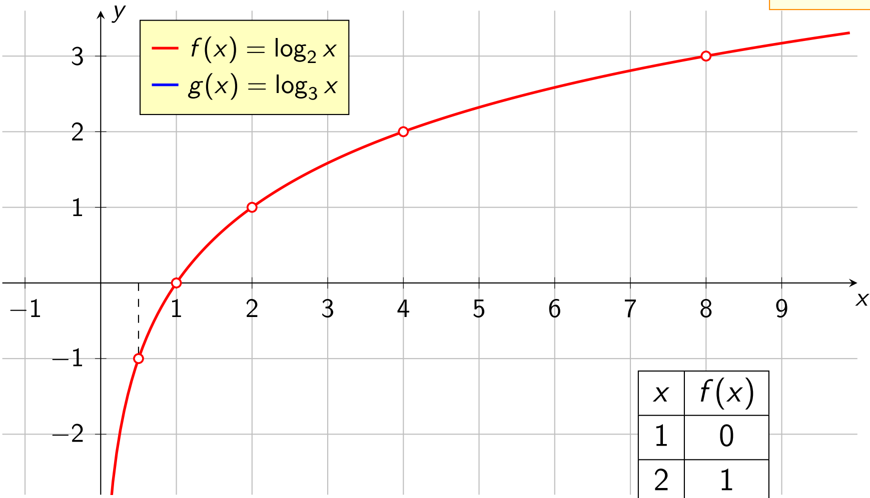


$$\log_2 \frac{1}{2} = \log_2 2^{-1} = -1$$

x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

Rješenje $f : \langle 0, +\infty\rangle \to \mathbb{R}$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\log_a a^x = x$

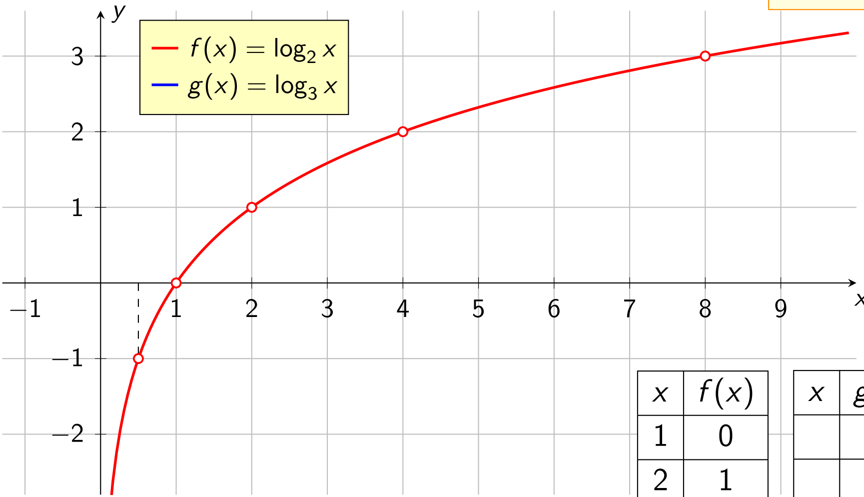


x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\qquad$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$

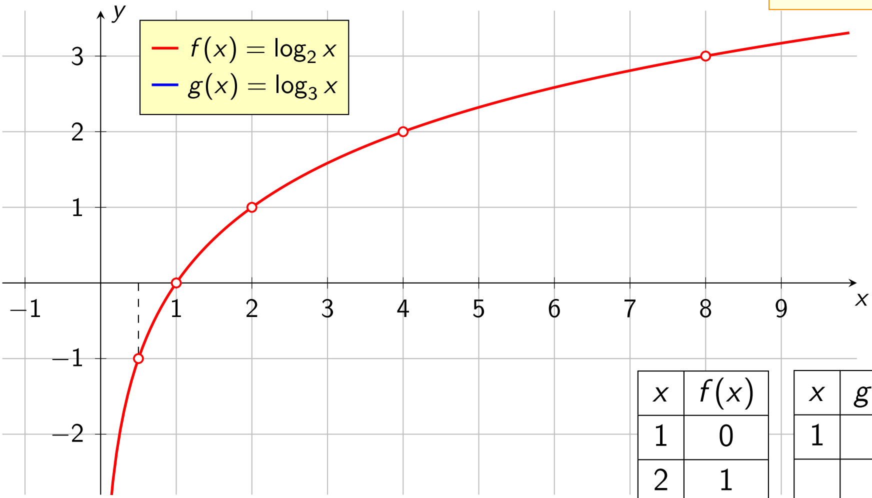


x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$

Rješenje $f : \langle 0, +\infty \rangle \to \mathbb{R}$ $g : \langle 0, +\infty \rangle \to \mathbb{R}$

$$\boxed{\log_a a^x = x}$$



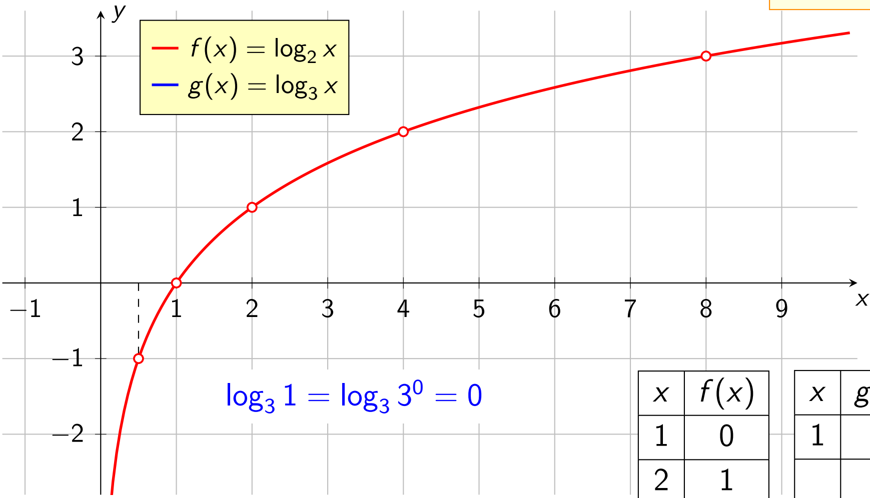
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\qquad$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



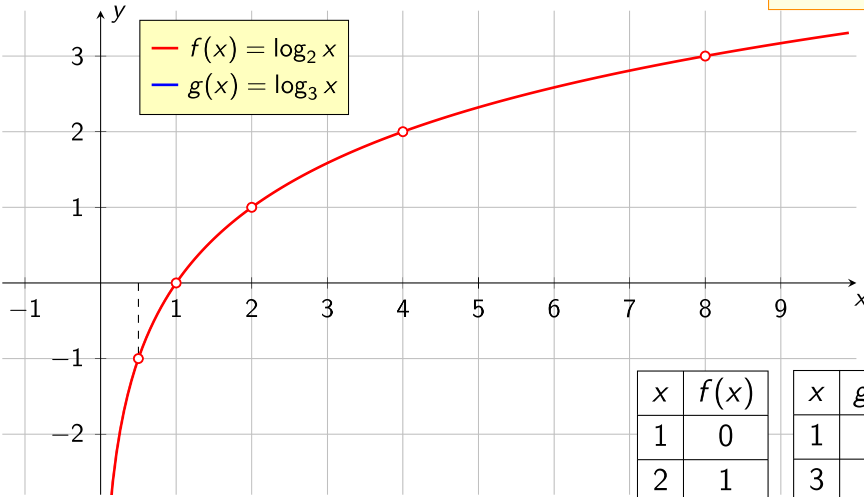
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\qquad$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



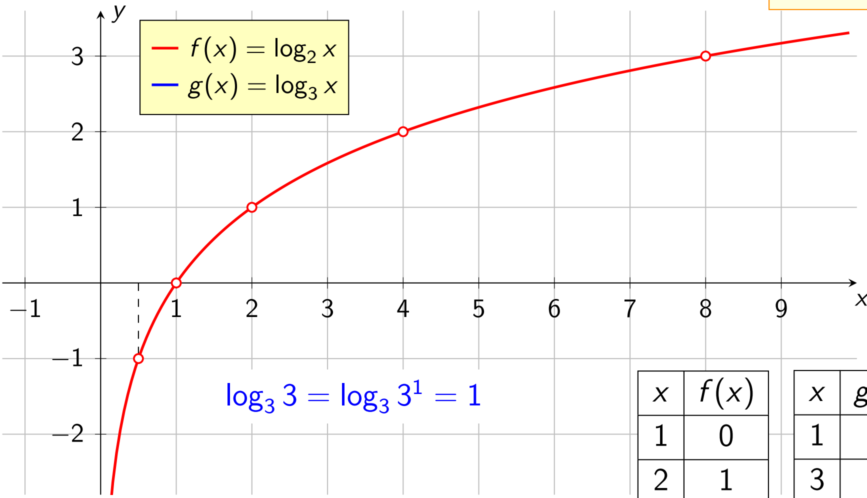
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	

Rješenje

$f : \langle 0, +\infty \rangle \to \mathbb{R}$ $\qquad$ $g : \langle 0, +\infty \rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



$\log_3 3 = \log_3 3^1 = 1$

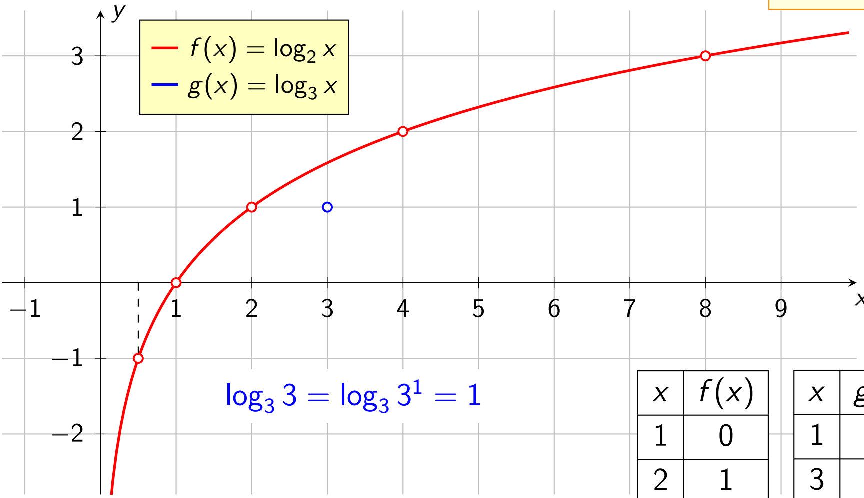
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1

Rješenje

$f : \langle 0, +\infty \rangle \to \mathbb{R}$ $\qquad$ $g : \langle 0, +\infty \rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



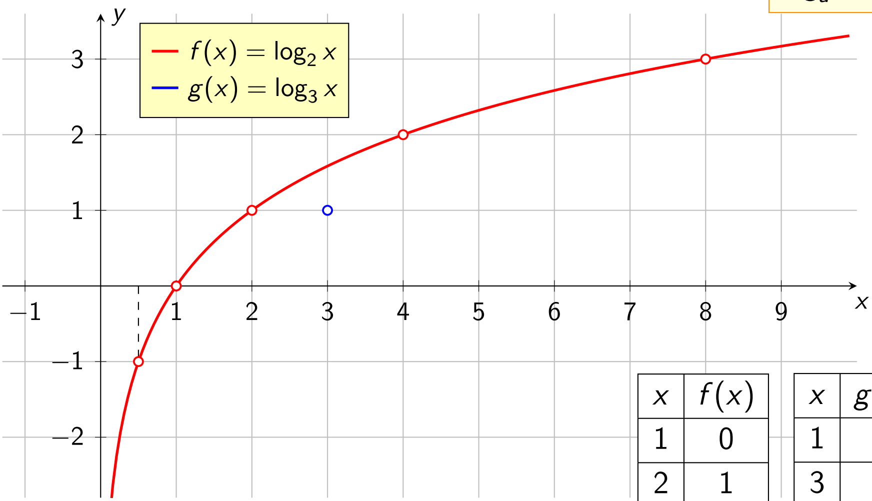
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\qquad g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



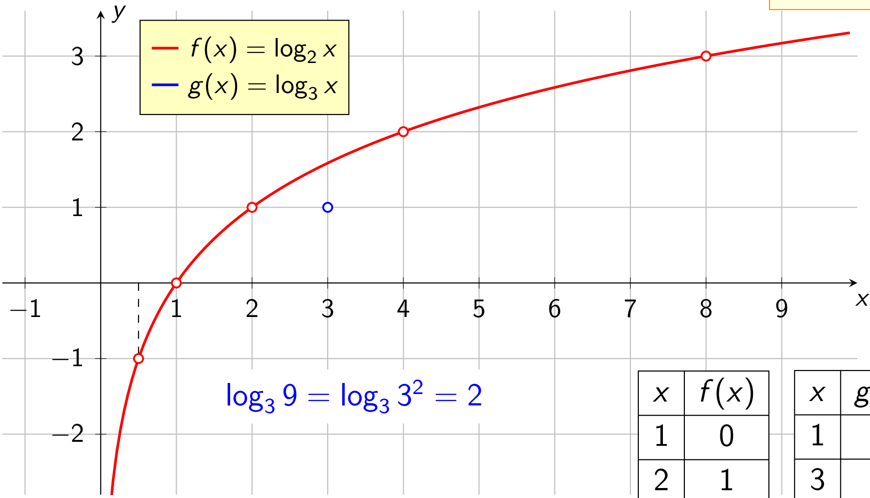
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\quad g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



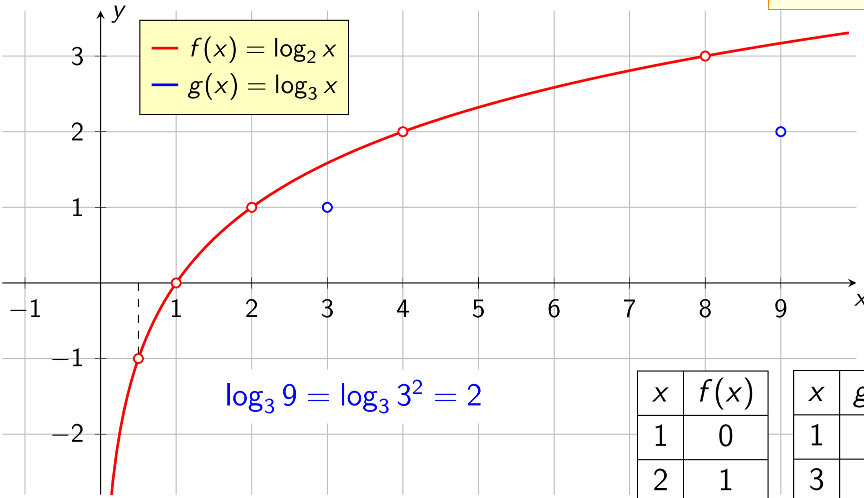
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\qquad$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$$\boxed{\log_a a^x = x}$$

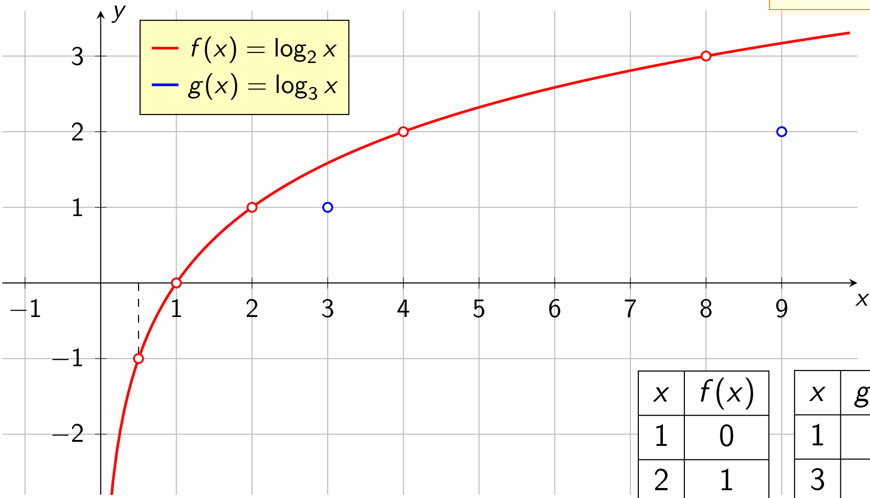


x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2

Rješenje $f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\quad g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



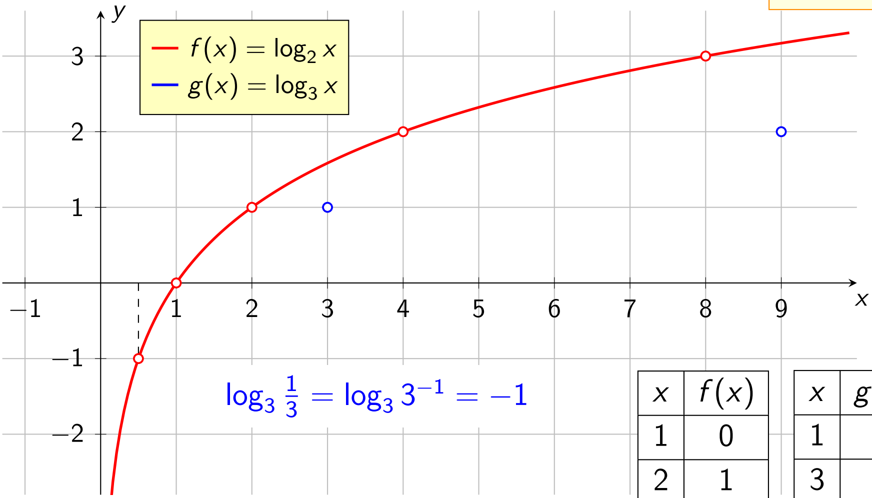
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\qquad$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$

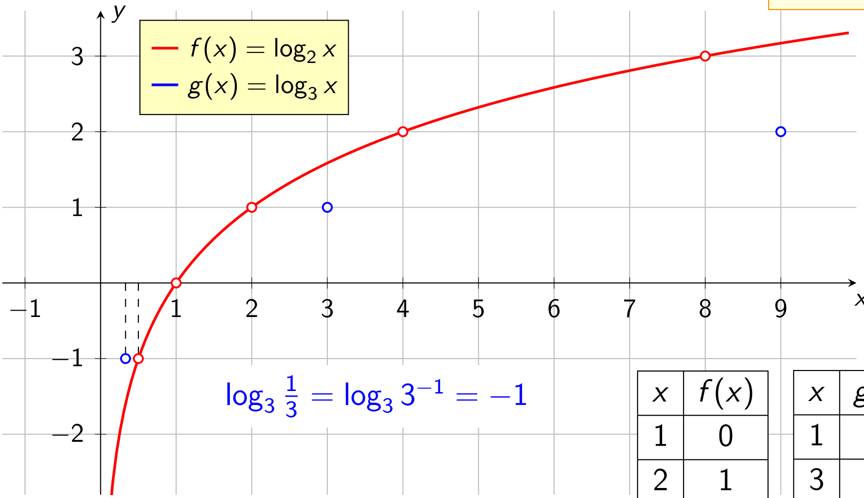


x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1

Rješenje $f : \langle 0, +\infty\rangle \to \mathbb{R}$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$$\log_a a^x = x$$



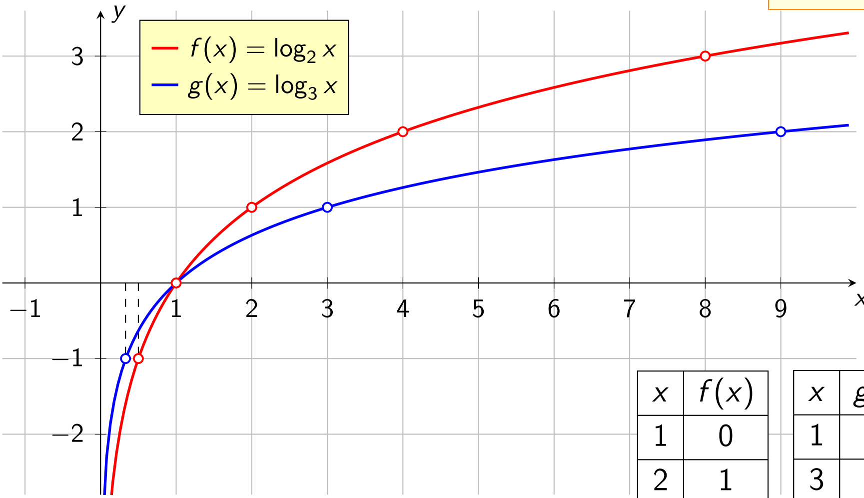
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\quad$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$$\log_a a^x = x$$



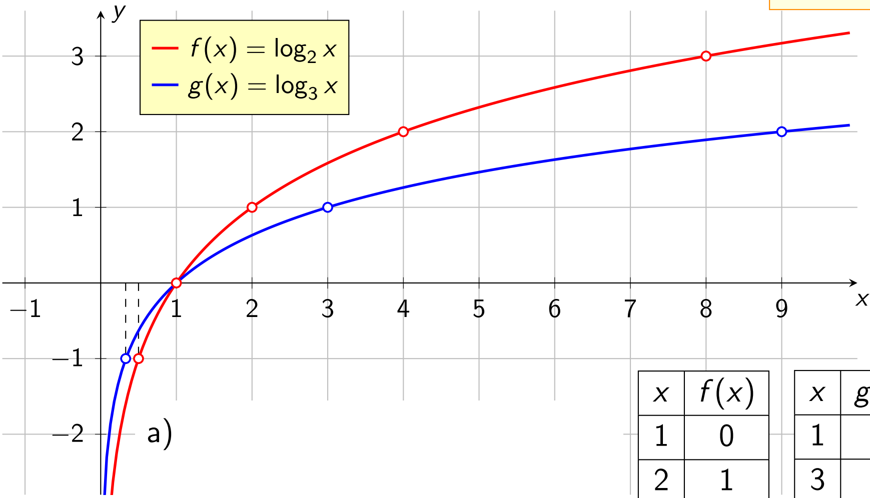
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\quad g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



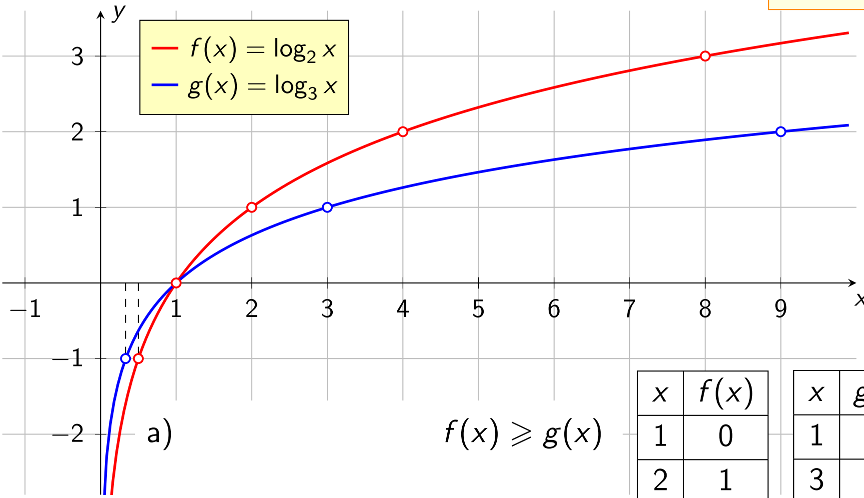
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\qquad$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$$\log_a a^x = x$$



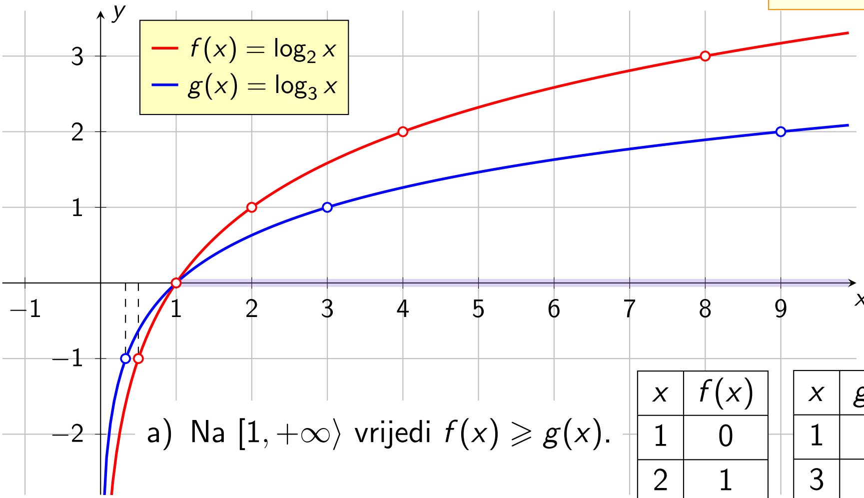
a) $\qquad f(x) \geqslant g(x)$

x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1

Rješenje $f : \langle 0, +\infty\rangle \to \mathbb{R}$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



a) Na $[1, +\infty\rangle$ vrijedi $f(x) \geqslant g(x)$.

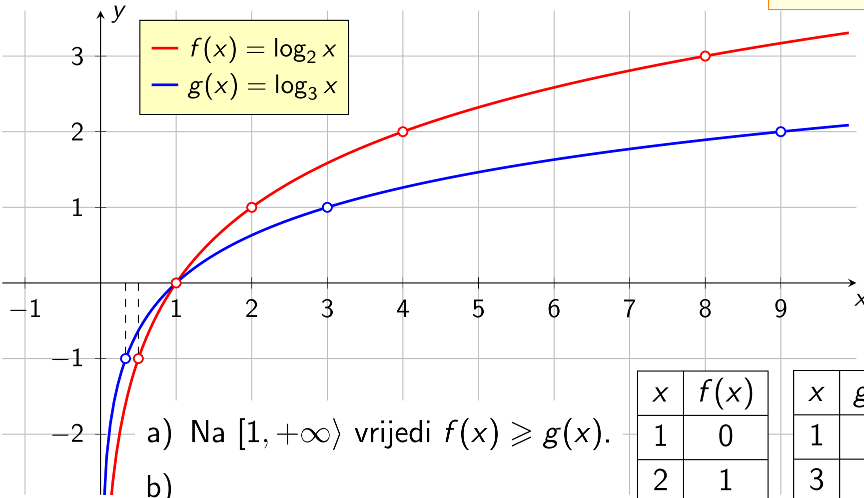
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\qquad$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$$\log_a a^x = x$$



a) Na $[1, +\infty\rangle$ vrijedi $f(x) \geqslant g(x)$.

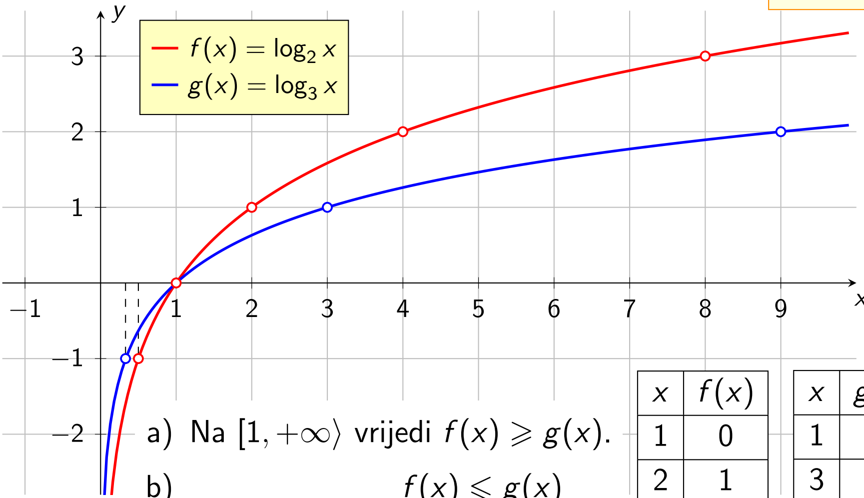
b)

x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1

Rješenje

$f : \langle 0, +\infty \rangle \to \mathbb{R}$ $\qquad$ $g : \langle 0, +\infty \rangle \to \mathbb{R}$ $\qquad$ $\boxed{\log_a a^x = x}$



a) Na $[1, +\infty\rangle$ vrijedi $f(x) \geqslant g(x)$.

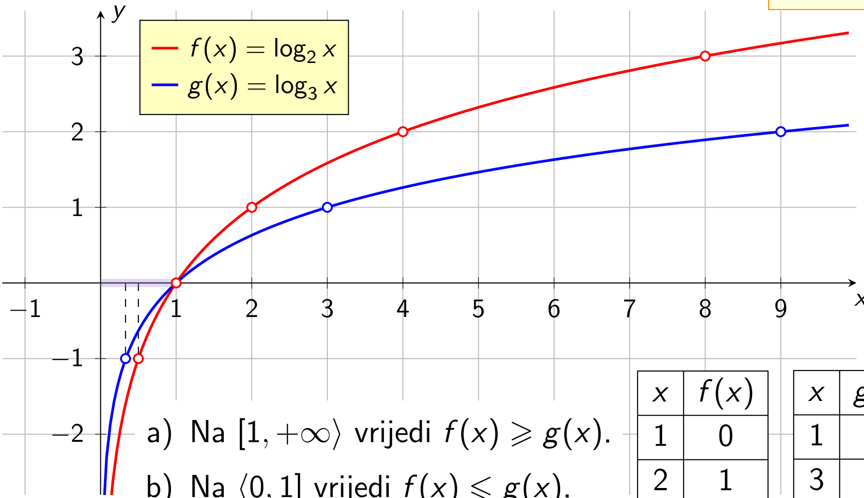
b) $f(x) \leqslant g(x)$

x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1

Rješenje $f : \langle 0, +\infty\rangle \to \mathbb{R}$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$$\log_a a^x = x$$



a) Na $[1, +\infty\rangle$ vrijedi $f(x) \geqslant g(x)$.

b) Na $\langle 0, 1]$ vrijedi $f(x) \leqslant g(x)$.

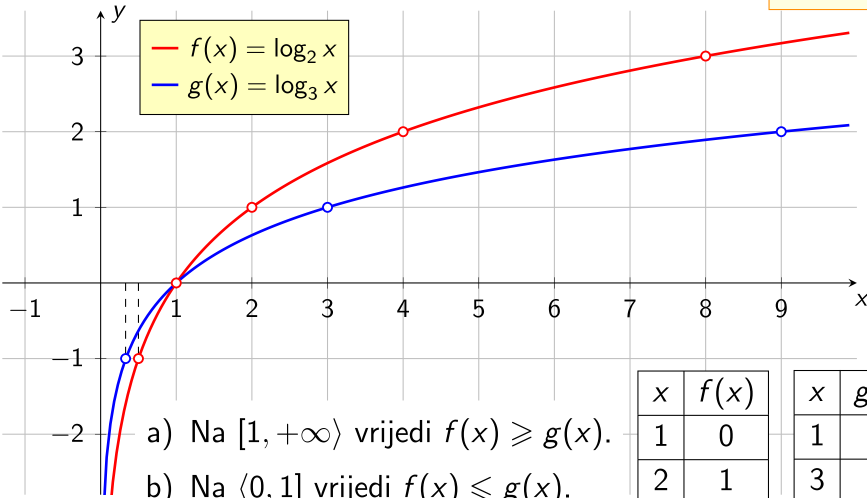
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1

Rješenje

$f:\langle 0,+\infty\rangle \to \mathbb{R}$ $\qquad$ $g:\langle 0,+\infty\rangle \to \mathbb{R}$

$\log_a a^x = x$



a) Na $[1,+\infty\rangle$ vrijedi $f(x) \geqslant g(x)$.

b) Na $\langle 0,1]$ vrijedi $f(x) \leqslant g(x)$.

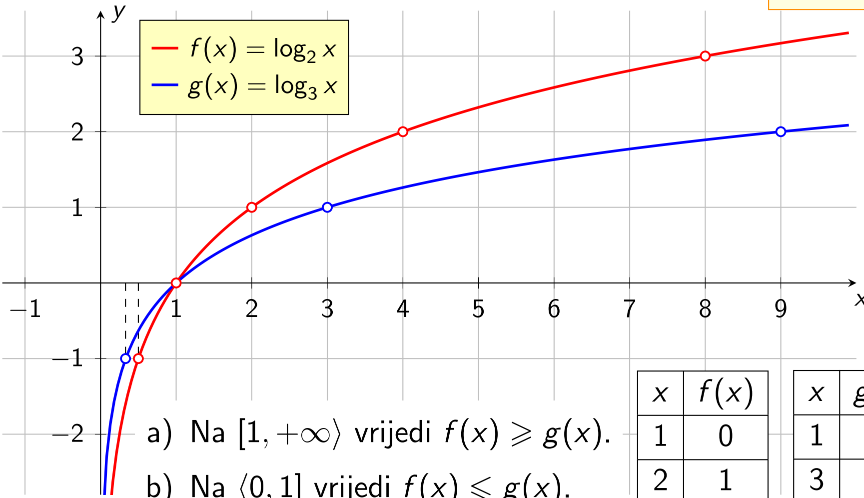
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1

c)

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\qquad g : \langle 0, +\infty\rangle \to \mathbb{R}$ $\qquad \boxed{\log_a a^x = x}$



x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1

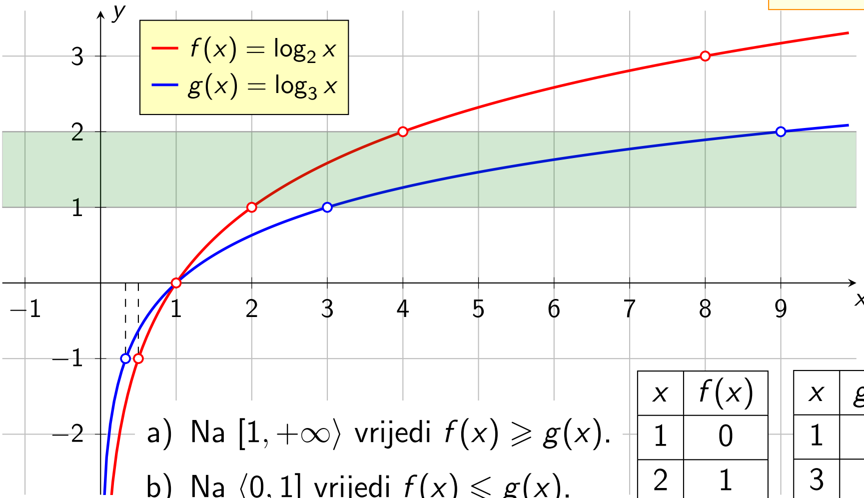
a) Na $[1, +\infty\rangle$ vrijedi $f(x) \geqslant g(x)$.

b) Na $\langle 0, 1]$ vrijedi $f(x) \leqslant g(x)$.

c) $\quad 1 \leqslant f(x) \leqslant 2$

Rješenje $f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\quad g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



a) Na $[1, +\infty\rangle$ vrijedi $f(x) \geqslant g(x)$.

b) Na $\langle 0, 1]$ vrijedi $f(x) \leqslant g(x)$.

x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

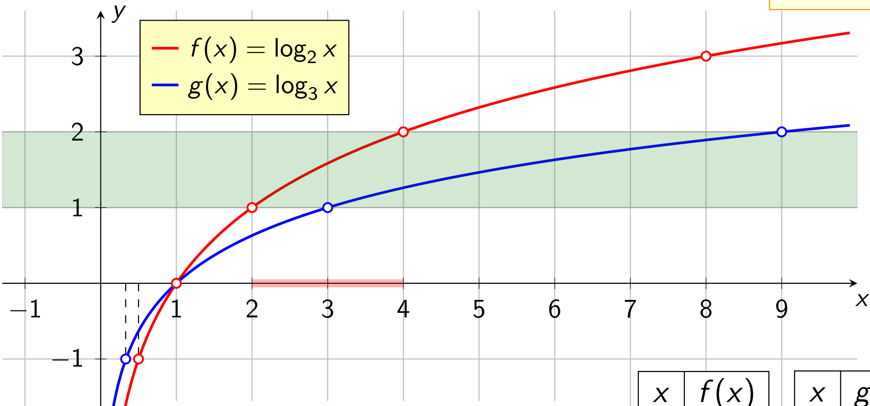
x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1

c) $$1 \leqslant f(x) \leqslant 2$$

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\quad$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



a) Na $[1, +\infty\rangle$ vrijedi $f(x) \geqslant g(x)$.

b) Na $\langle 0, 1]$ vrijedi $f(x) \leqslant g(x)$.

c) Na $[2, 4]$ vrijedi $1 \leqslant f(x) \leqslant 2$.

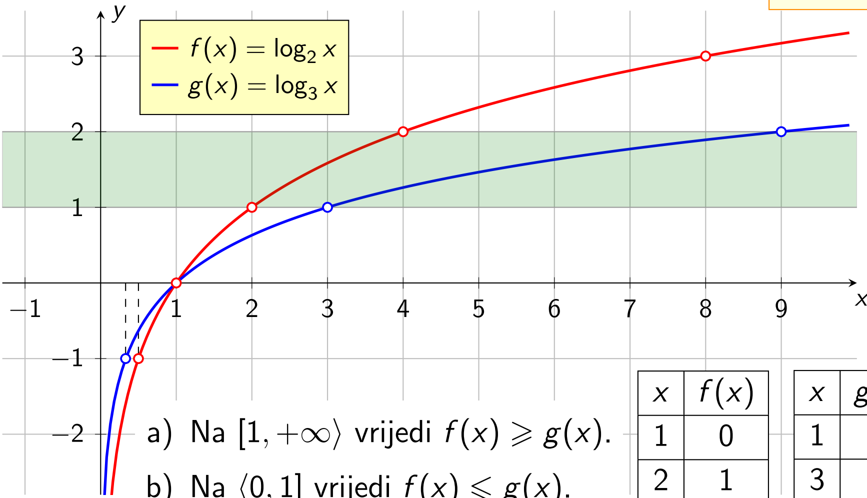
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\qquad$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



a) Na $[1, +\infty\rangle$ vrijedi $f(x) \geqslant g(x)$.

b) Na $\langle 0, 1]$ vrijedi $f(x) \leqslant g(x)$.

c) Na $[2, 4]$ vrijedi $1 \leqslant f(x) \leqslant 2$.

d)

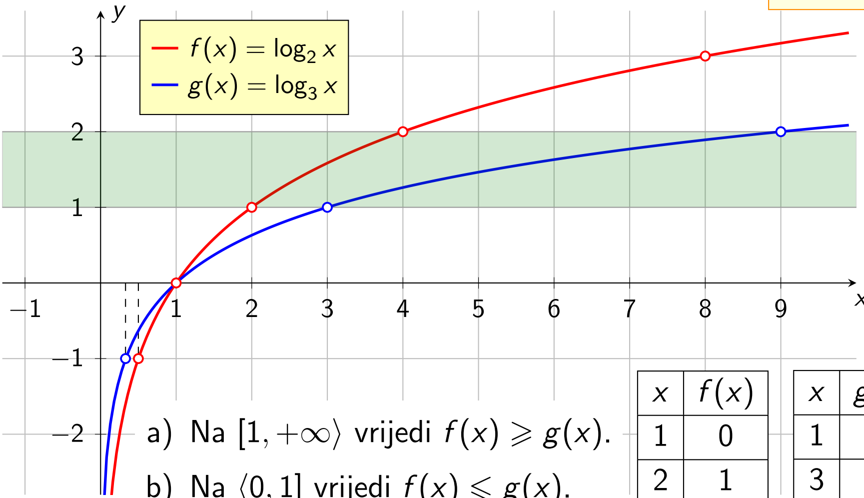
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1

Rješenje

$f : \langle 0, +\infty\rangle \to \mathbb{R}$ $\qquad$ $g : \langle 0, +\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



a) Na $[1, +\infty\rangle$ vrijedi $f(x) \geqslant g(x)$.

b) Na $\langle 0, 1]$ vrijedi $f(x) \leqslant g(x)$.

c) Na $[2, 4]$ vrijedi $1 \leqslant f(x) \leqslant 2$.

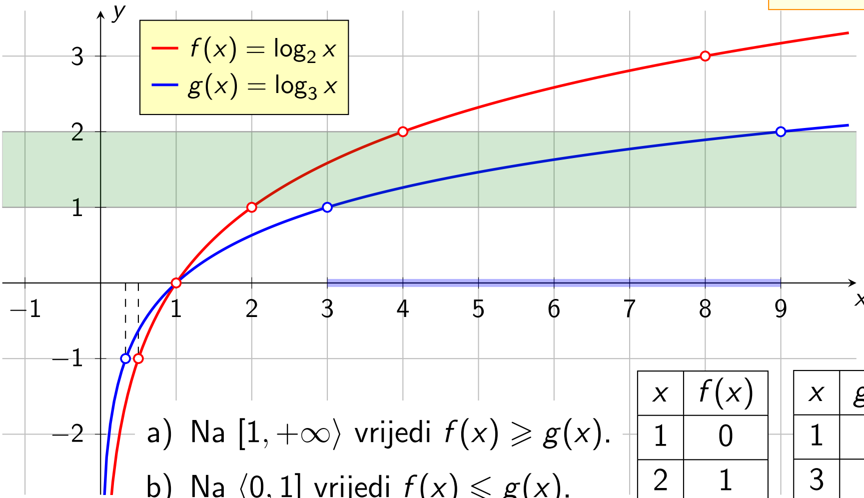
d) $1 \leqslant g(x) \leqslant 2$

x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1

Rješenje $f:\langle 0,+\infty\rangle \to \mathbb{R}$ $g:\langle 0,+\infty\rangle \to \mathbb{R}$

$\boxed{\log_a a^x = x}$



a) Na $[1,+\infty\rangle$ vrijedi $f(x) \geqslant g(x)$.

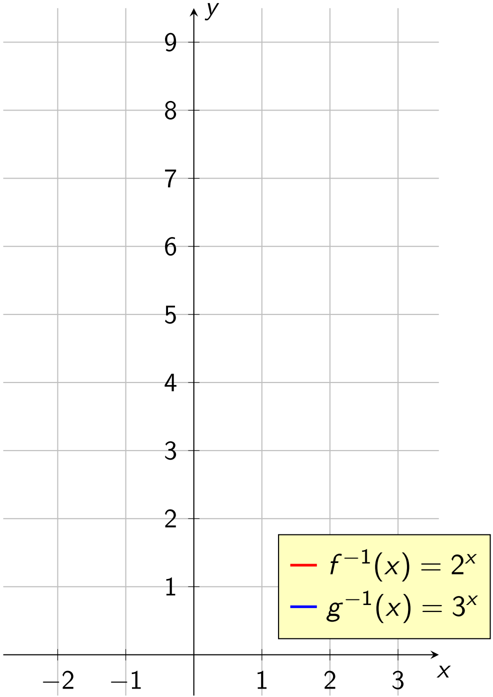
b) Na $\langle 0,1]$ vrijedi $f(x) \leqslant g(x)$.

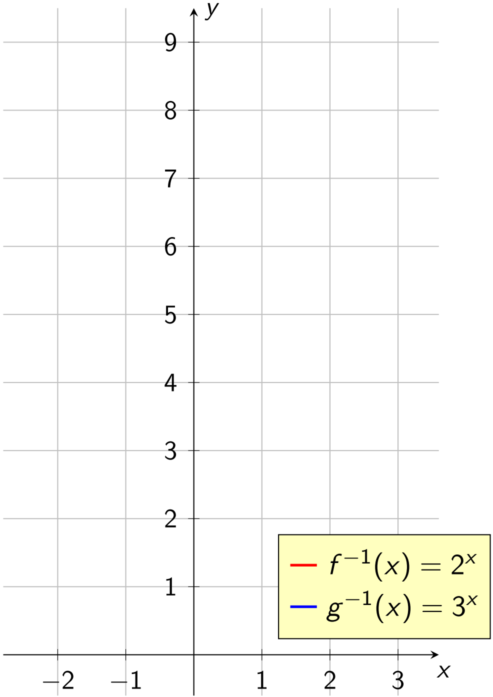
c) Na $[2,4]$ vrijedi $1 \leqslant f(x) \leqslant 2$.

d) Na $[3,9]$ vrijedi $1 \leqslant g(x) \leqslant 2$.

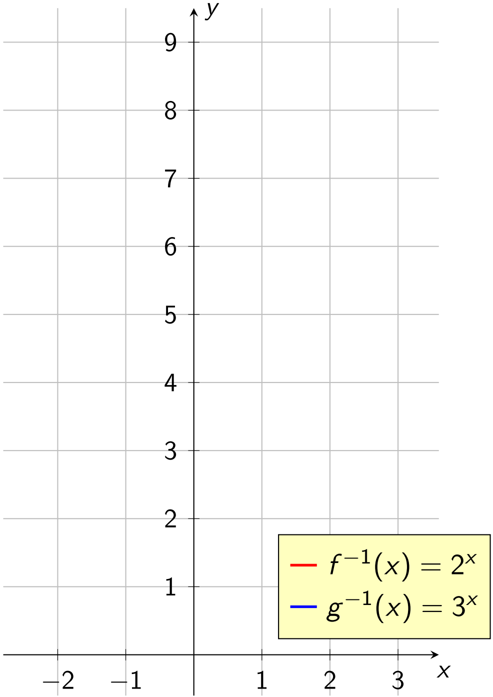
x	$f(x)$
1	0
2	1
4	2
8	3
$\frac{1}{2}$	-1

x	$g(x)$
1	0
3	1
9	2
$\frac{1}{3}$	-1


y
9
8
7
6
5
4
3
2
1
−2
−1
1
2
3
x
$f^{-1}(x) = 2^x$
$g^{-1}(x) = 3^x$

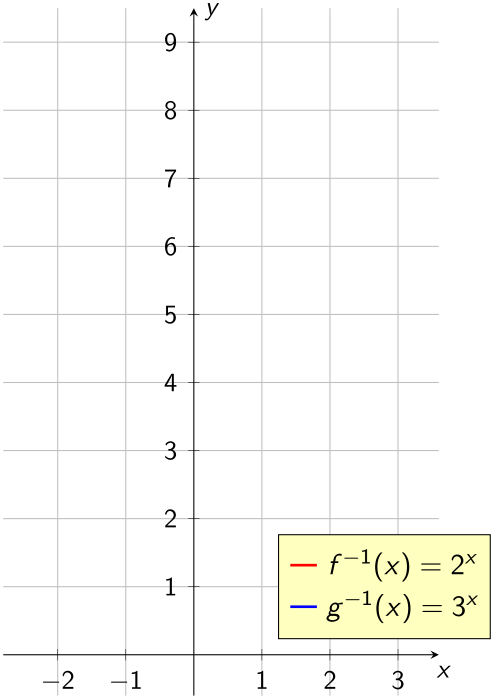


$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$



$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$



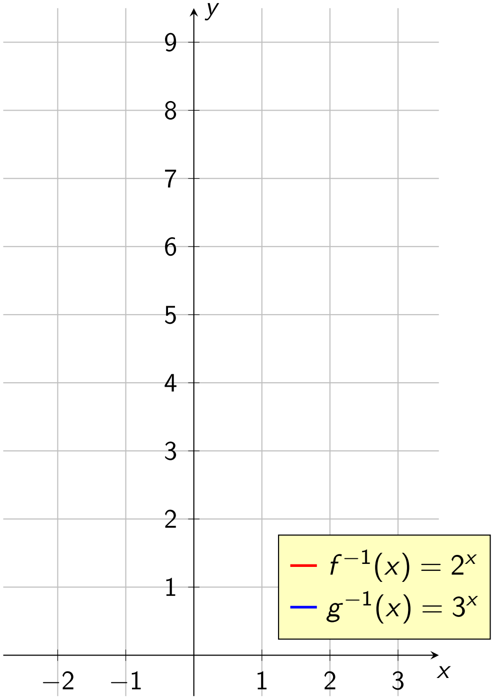
$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

x	$f^{-1}(x)$

$$f^{-1} : \mathbb{R} \to \langle 0, +\infty\rangle$$

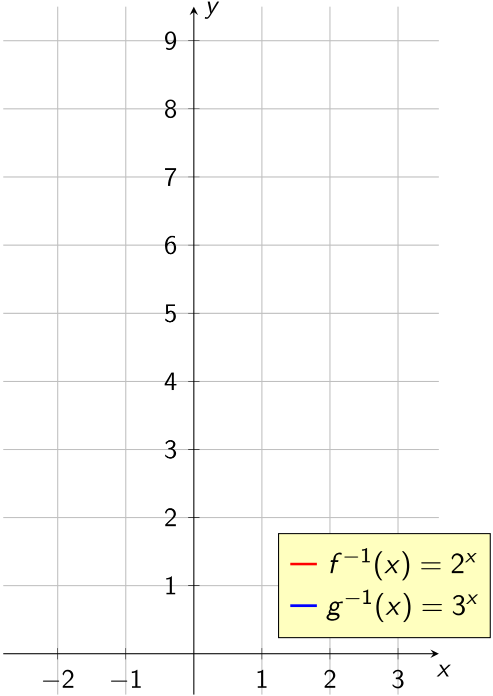
$$g^{-1} : \mathbb{R} \to \langle 0, +\infty\rangle$$



x	$f^{-1}(x)$
0	

$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

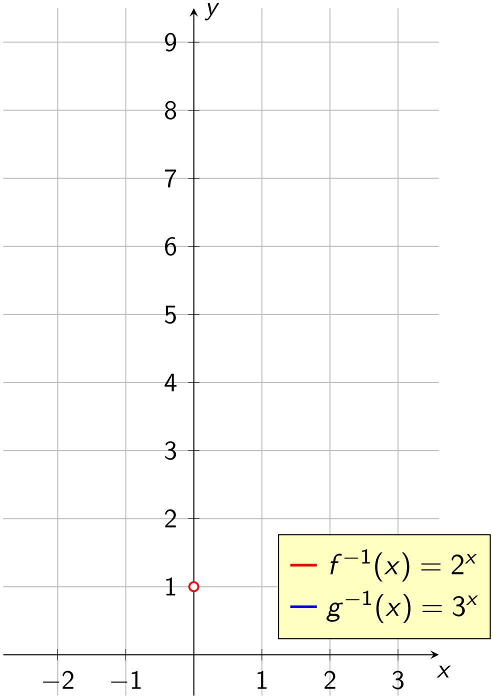
$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$



x	$f^{-1}(x)$
0	1

$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

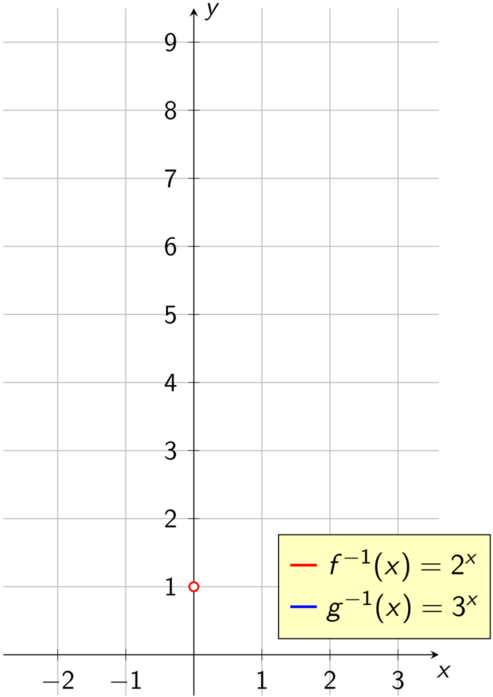
$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$



x	$f^{-1}(x)$
0	1

$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

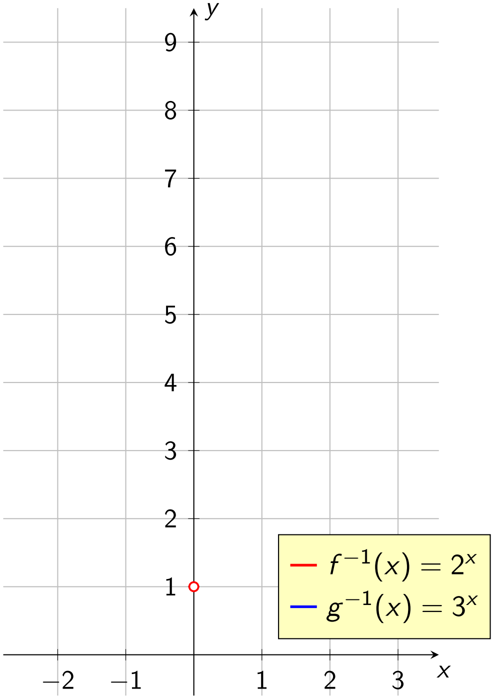
$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$



x	$f^{-1}(x)$
0	1
1	

$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

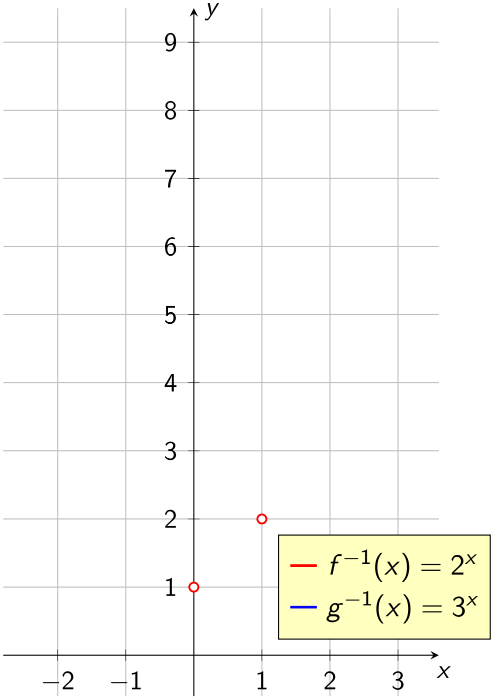
$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$



x	$f^{-1}(x)$
0	1
1	2

$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

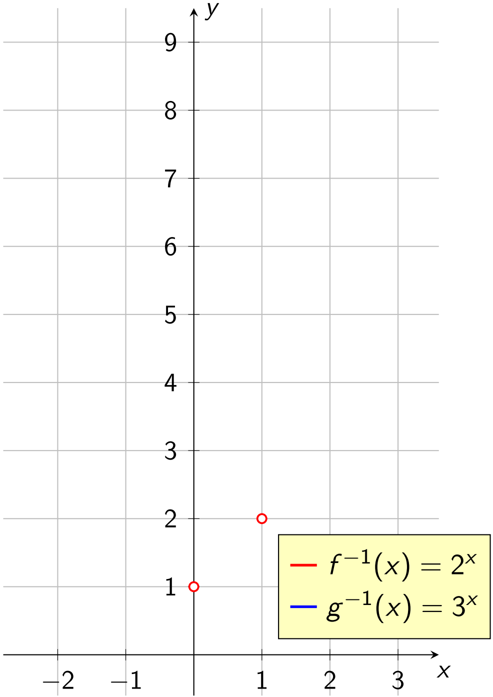
$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$



x	$f^{-1}(x)$
0	1
1	2

$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

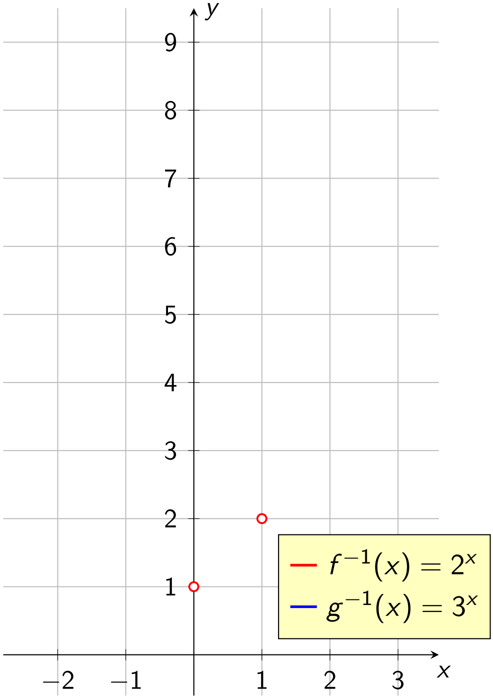
$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$



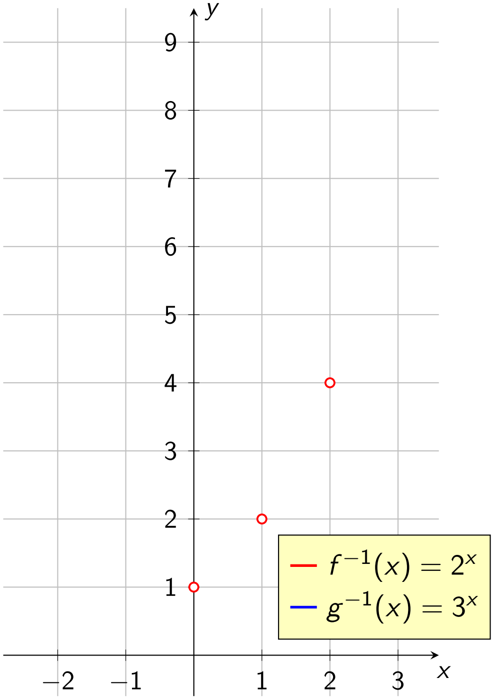
x	$f^{-1}(x)$
0	1
1	2
2	

$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$



x	$f^{-1}(x)$
0	1
1	2
2	4



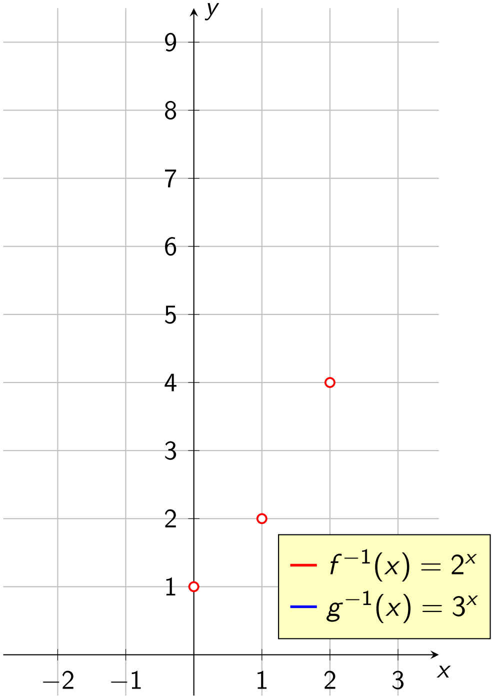
$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

x	$f^{-1}(x)$
0	1
1	2
2	4

$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

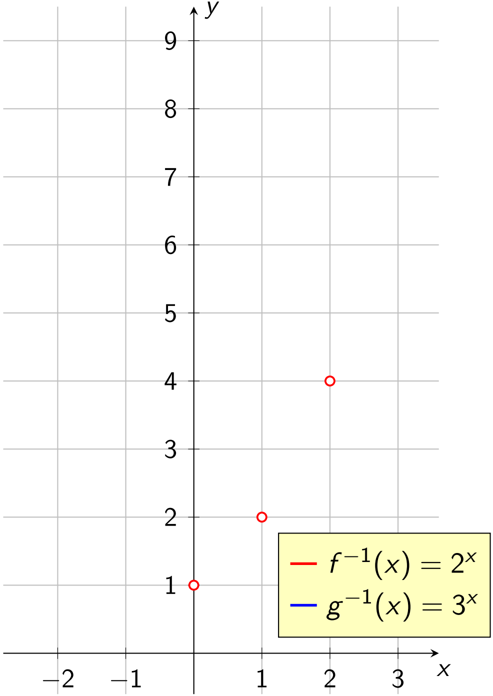
$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$



x	$f^{-1}(x)$
0	1
1	2
2	4
3	

$$f^{-1}: \mathbb{R} \to \langle 0, +\infty \rangle$$

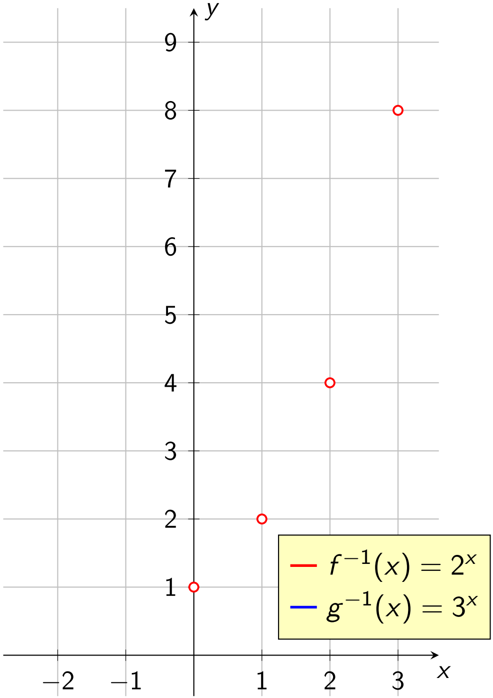
$$g^{-1}: \mathbb{R} \to \langle 0, +\infty \rangle$$



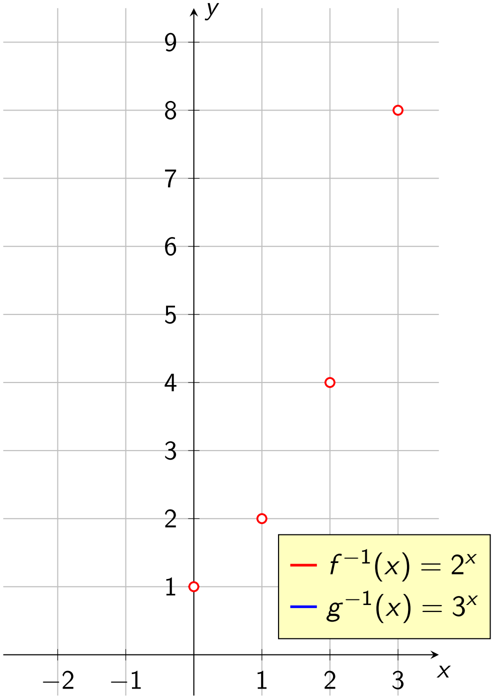
x	$f^{-1}(x)$
0	1
1	2
2	4
3	8

$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$



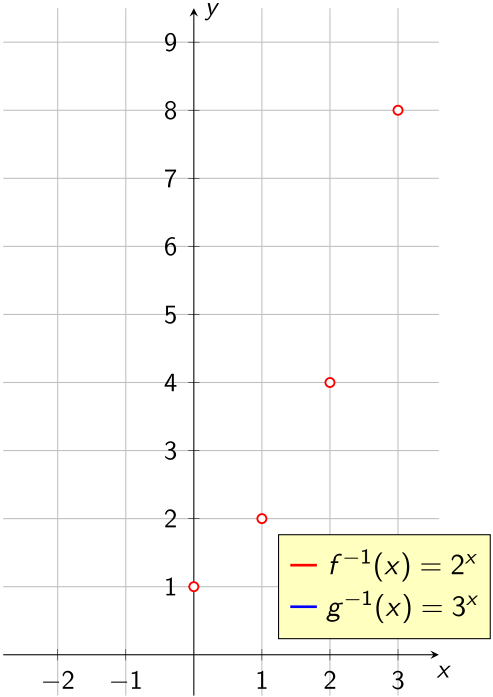
x	$f^{-1}(x)$
0	1
1	2
2	4
3	8



$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

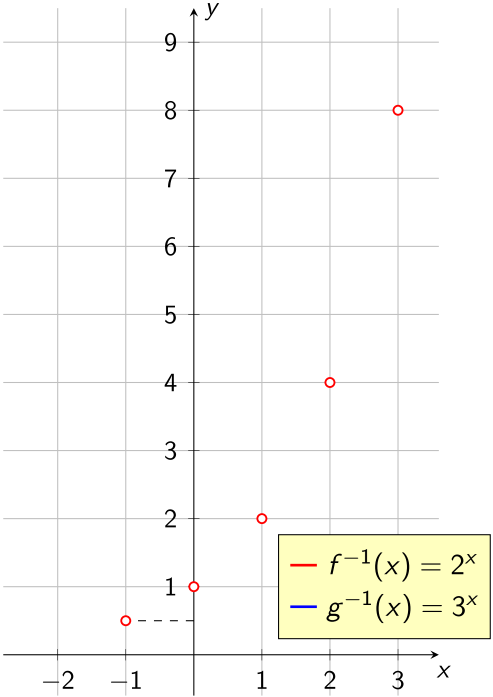
x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	



$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

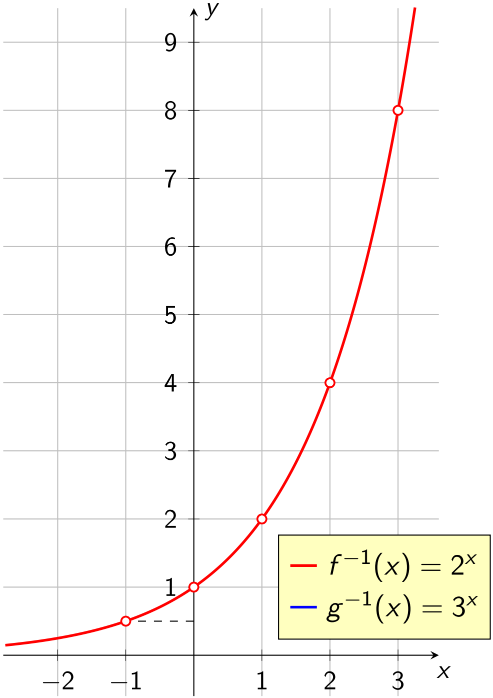
x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$



$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

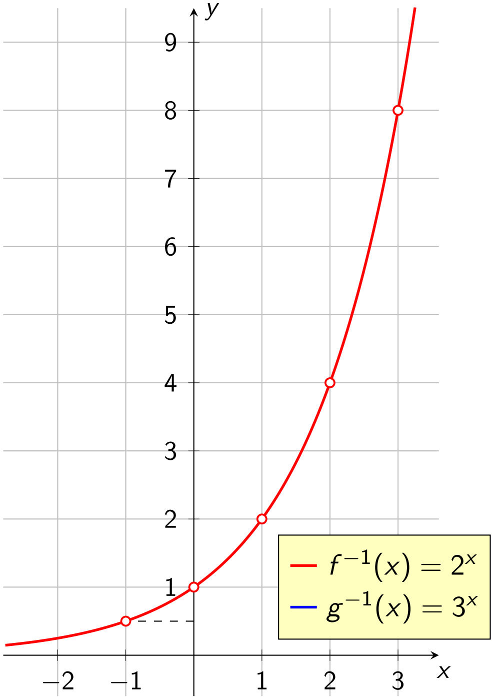
x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$



$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

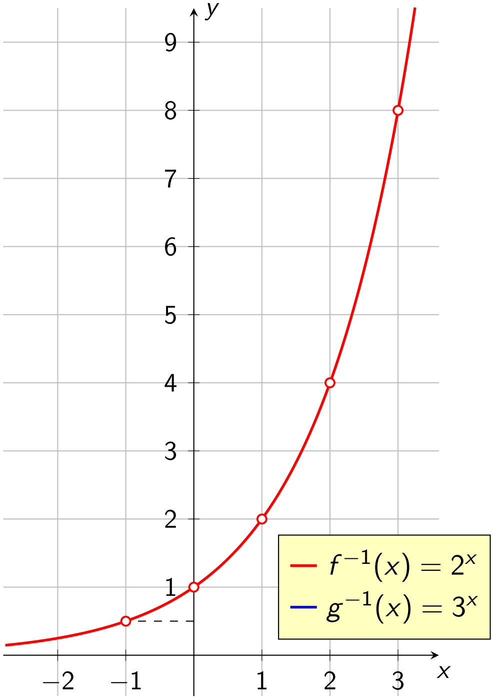


$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$

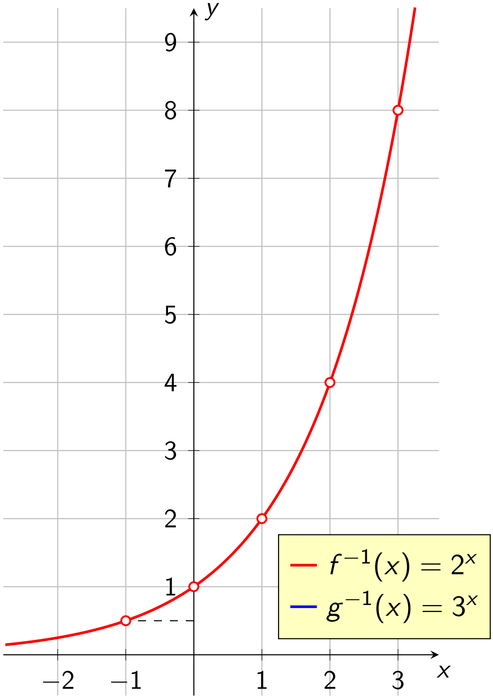


$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	

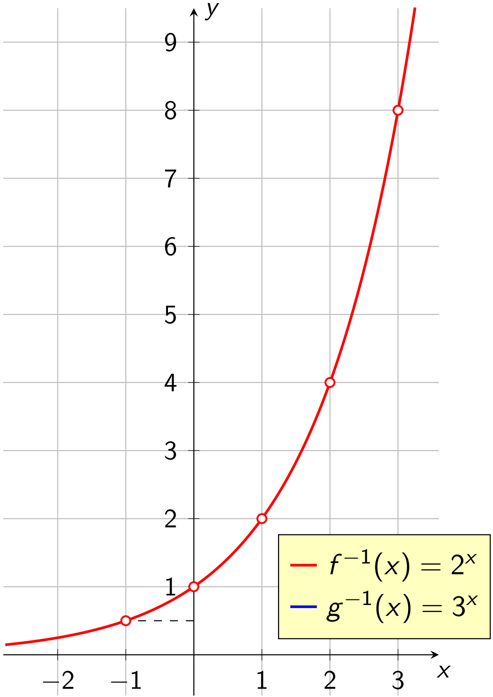


$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1

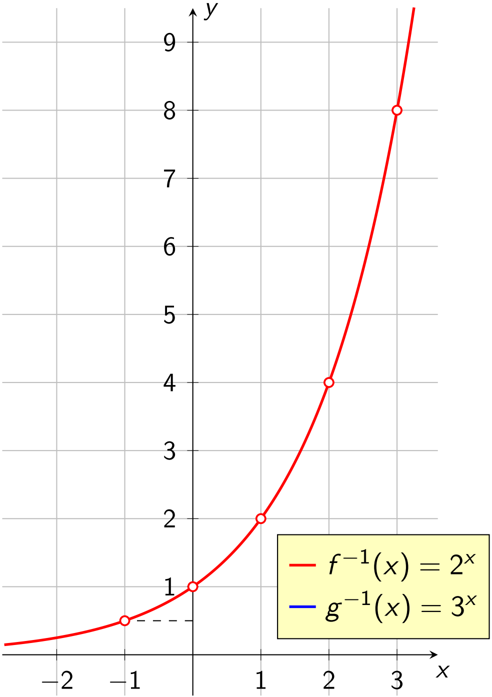


$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	

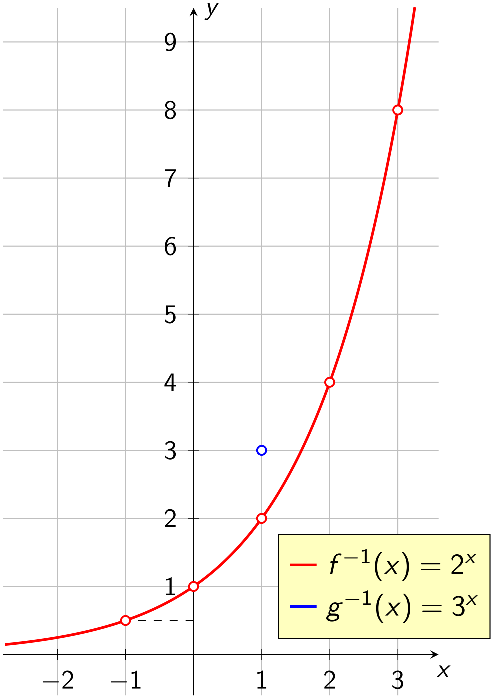


$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	3

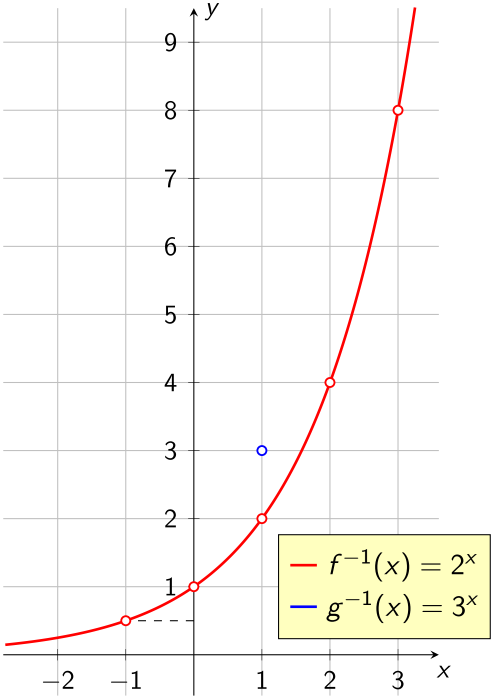


$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	3

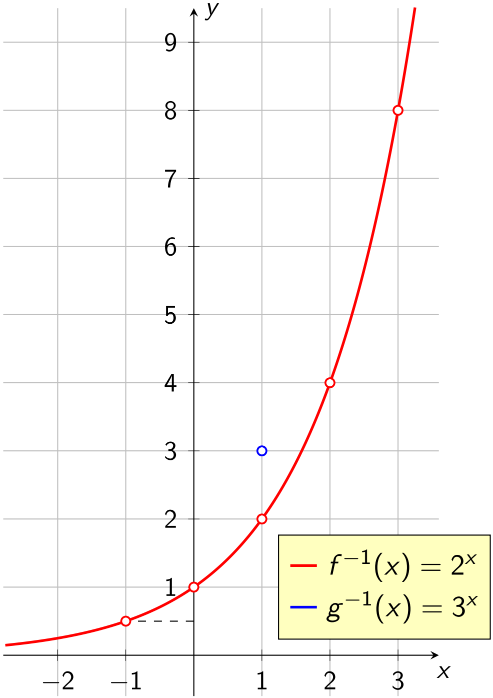


$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$

$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	3
2	

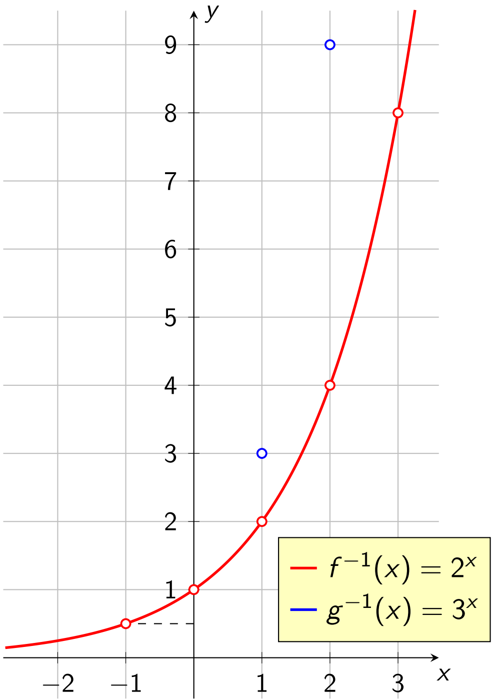


$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	3
2	9

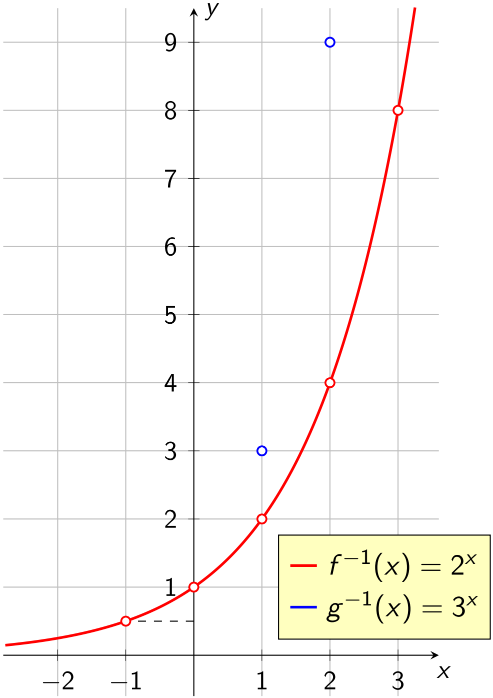


$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	3
2	9



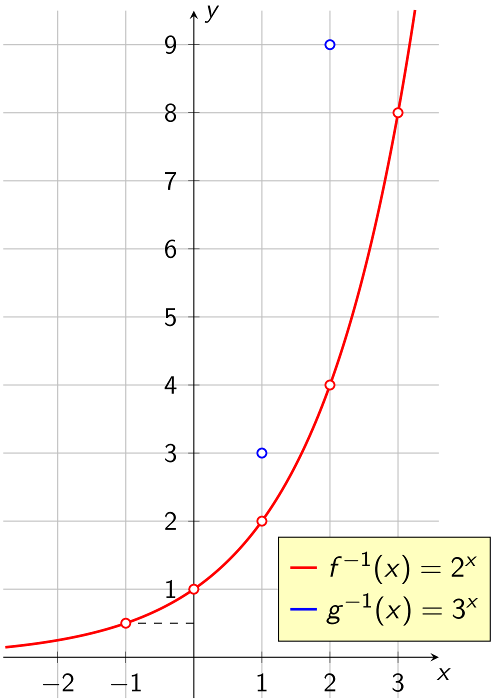
$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	3
2	9
-1	

$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$
$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

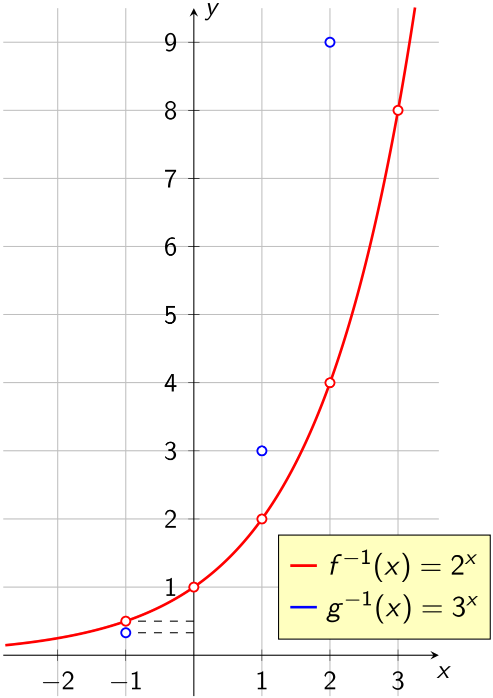


x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	3
2	9
-1	$\frac{1}{3}$

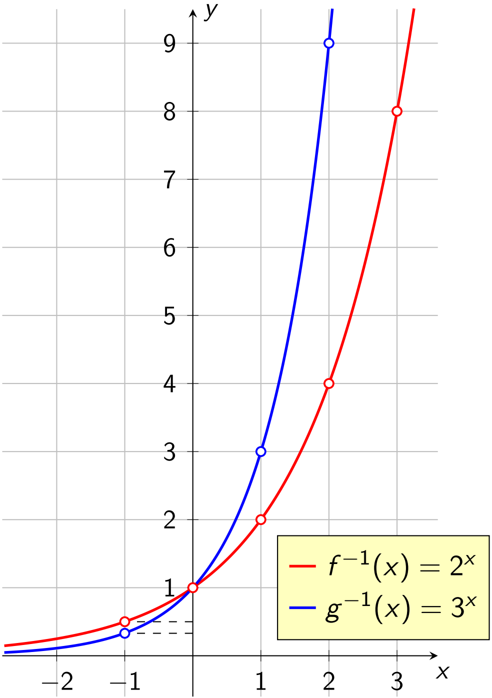
$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$

$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$



x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	3
2	9
-1	$\frac{1}{3}$

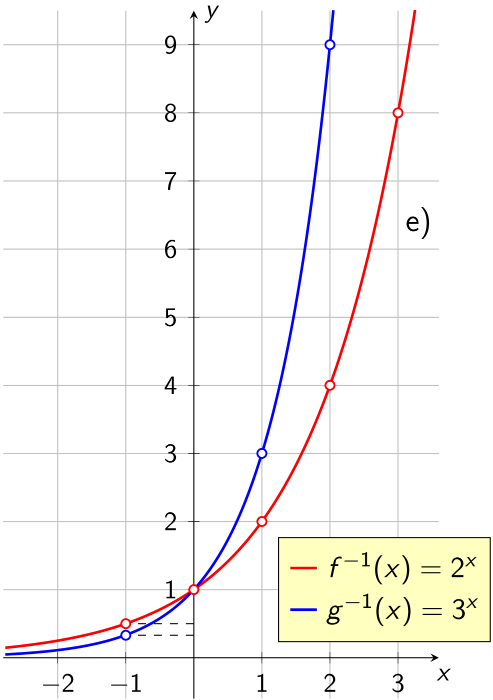


$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	3
2	9
-1	$\frac{1}{3}$

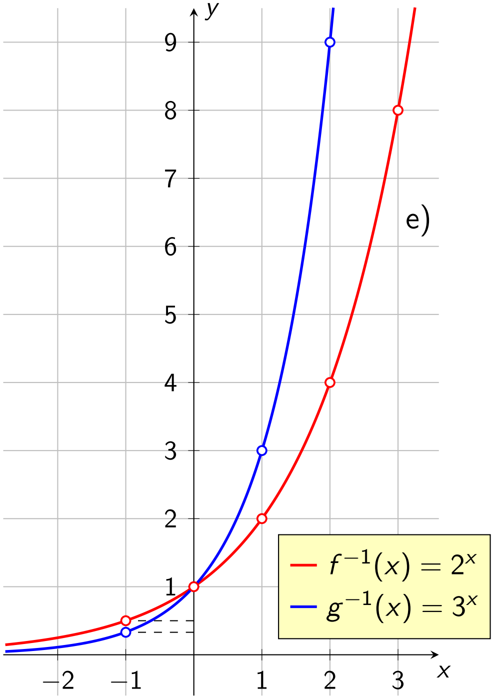


$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	3
2	9
-1	$\frac{1}{3}$



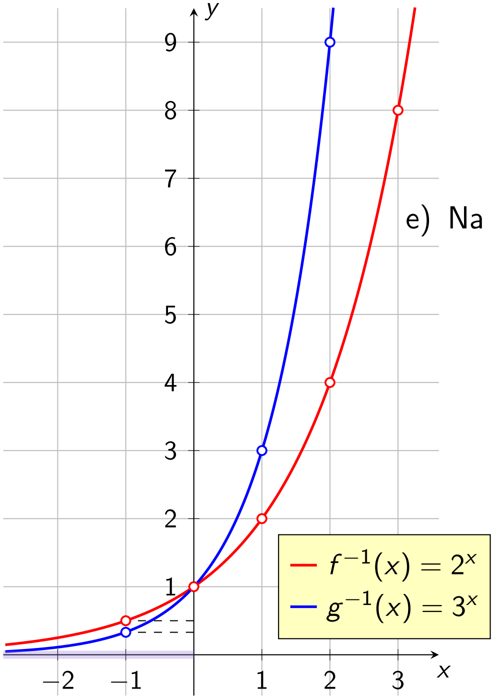
$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$f^{-1}(x) \geqslant g^{-1}(x)$$

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	3
2	9
-1	$\frac{1}{3}$



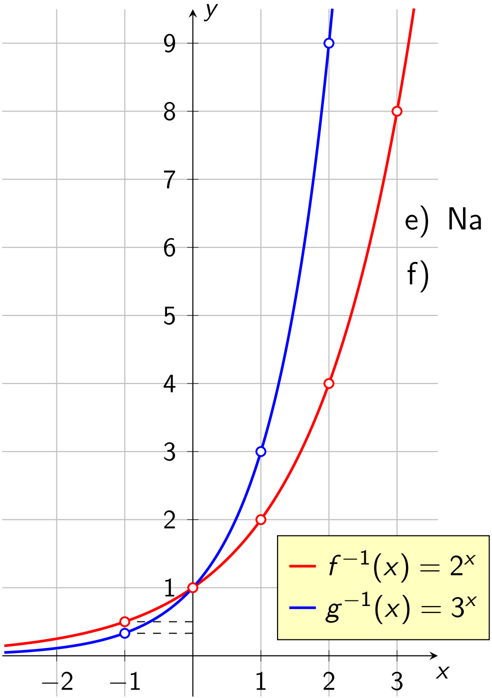
$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

e) Na $\langle -\infty, 0]$ vrijedi $f^{-1}(x) \geqslant g^{-1}(x)$.

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	3
2	9
-1	$\frac{1}{3}$



$f^{-1} : \mathbb{R} \to \langle 0, +\infty\rangle$

$g^{-1} : \mathbb{R} \to \langle 0, +\infty\rangle$

e) Na $\langle -\infty, 0]$ vrijedi $f^{-1}(x) \geqslant g^{-1}(x)$.

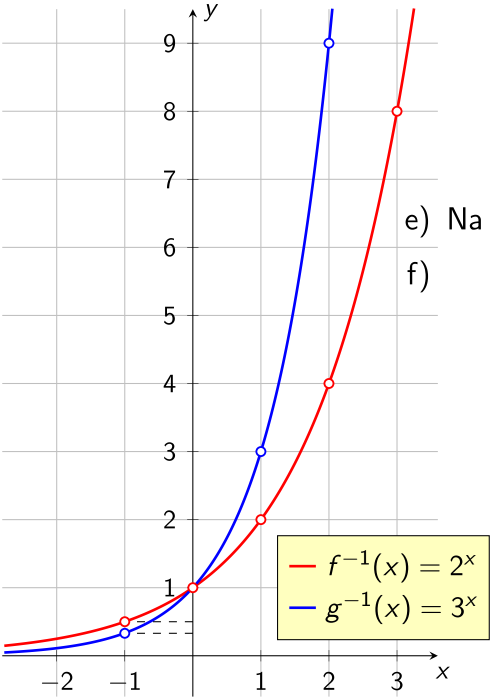
f)

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	3
2	9
-1	$\frac{1}{3}$

$$f^{-1}: \mathbb{R} \to \langle 0, +\infty\rangle$$

$$g^{-1}: \mathbb{R} \to \langle 0, +\infty\rangle$$

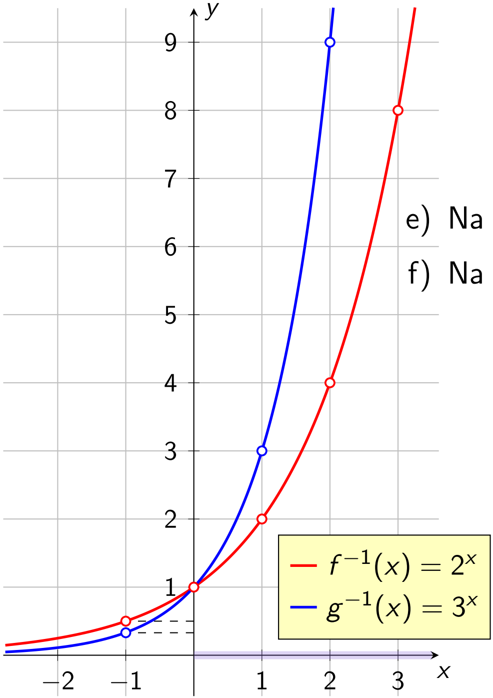


e) Na $\langle -\infty, 0]$ vrijedi $f^{-1}(x) \geqslant g^{-1}(x)$.

f) $f^{-1}(x) \leqslant g^{-1}(x)$

x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	3
2	9
-1	$\frac{1}{3}$



$$f^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

$$g^{-1} : \mathbb{R} \to \langle 0, +\infty \rangle$$

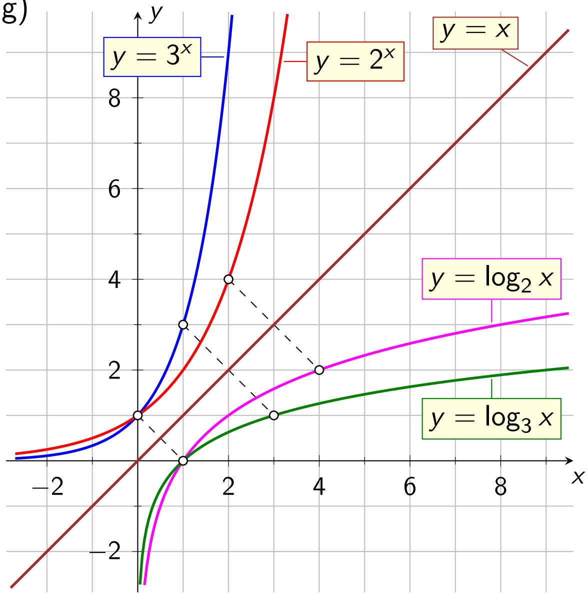
e) Na $\langle -\infty, 0]$ vrijedi $f^{-1}(x) \geqslant g^{-1}(x)$.

f) Na $[0, +\infty\rangle$ vrijedi $f^{-1}(x) \leqslant g^{-1}(x)$.

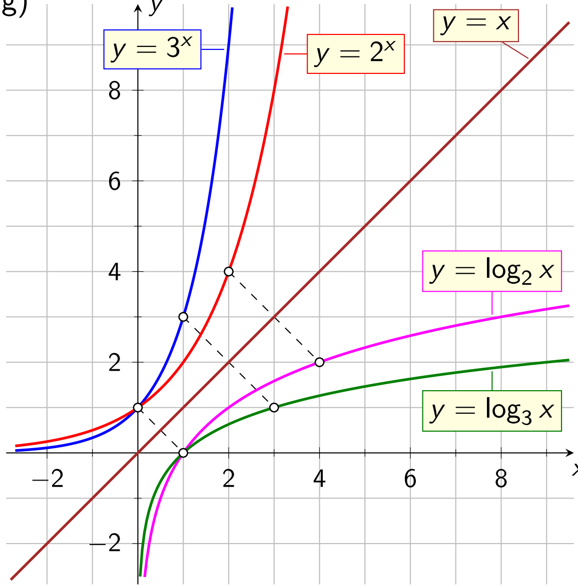
x	$f^{-1}(x)$
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

x	$g^{-1}(x)$
0	1
1	3
2	9
-1	$\frac{1}{3}$

g)



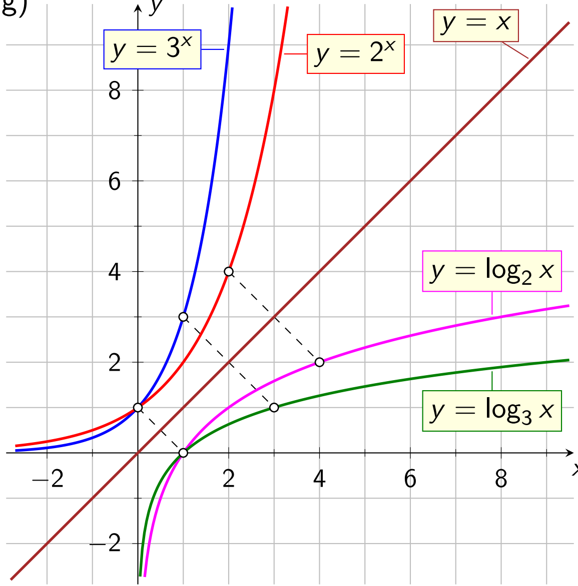
g)



$a > 1,\ k > 0,\ \ell \in \mathbb{R}$

$$\lim_{x \to +\infty} \frac{a^x}{kx + \ell} = +\infty$$

g)

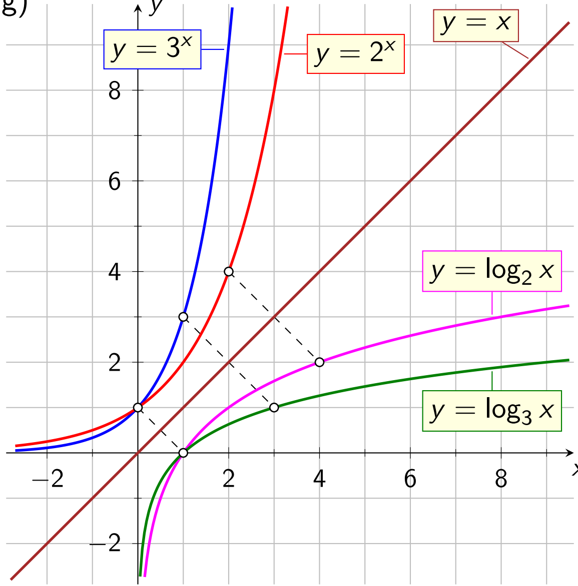


$a > 1,\ k > 0,\ \ell \in \mathbb{R}$

$$\lim_{x \to +\infty} \frac{a^x}{kx + \ell} = +\infty$$

$$\lim_{x \to +\infty} \frac{\log_a x}{kx + \ell} = 0$$

g)



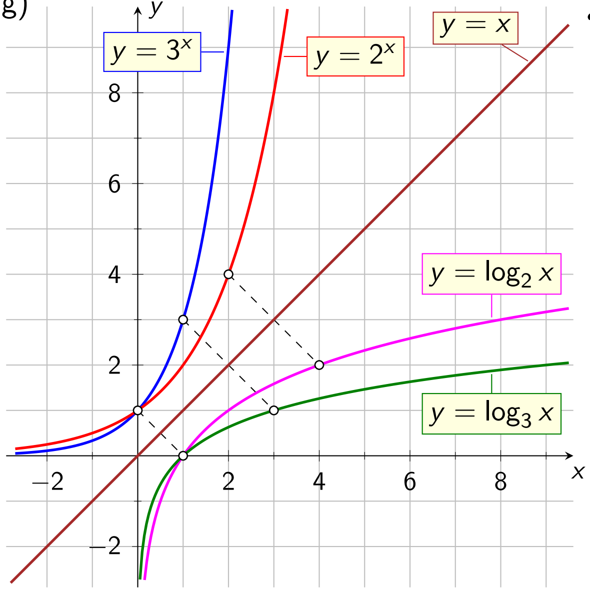
$a > 1,\ k > 0,\ \ell \in \mathbb{R},\ \mu > 0$

$$\lim_{x \to +\infty} \frac{a^x}{kx + \ell} = +\infty$$

$$\lim_{x \to +\infty} \frac{\log_a x}{kx + \ell} = 0$$

$$\lim_{x \to +\infty} \frac{a^x}{x^\mu} = +\infty$$

g)



$a > 1,\ k > 0,\ \ell \in \mathbb{R},\ \mu > 0$

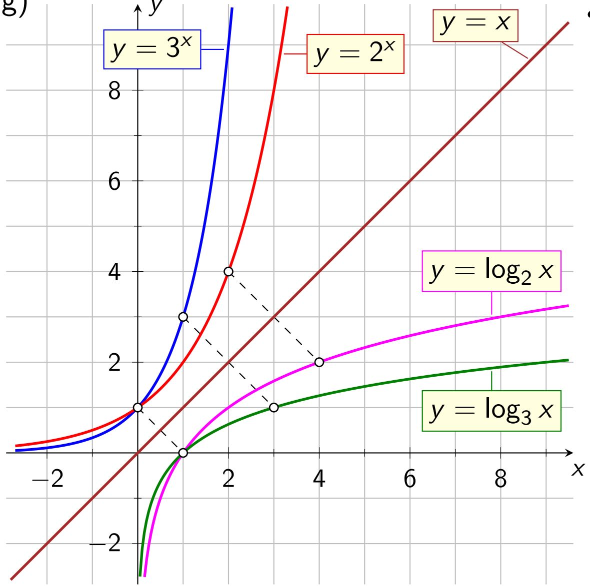
$$\lim_{x\to+\infty} \frac{a^x}{kx+\ell} = +\infty$$

$$\lim_{x\to+\infty} \frac{\log_a x}{kx+\ell} = 0$$

$$\lim_{x\to+\infty} \frac{a^x}{x^\mu} = +\infty$$

$$\lim_{x\to+\infty} \frac{\log_a x}{x^\mu} = 0$$

g)



$a > 1,\ k > 0,\ \ell \in \mathbb{R},\ \mu > 0$

$$\lim_{x \to +\infty} \frac{a^x}{kx + \ell} = +\infty$$

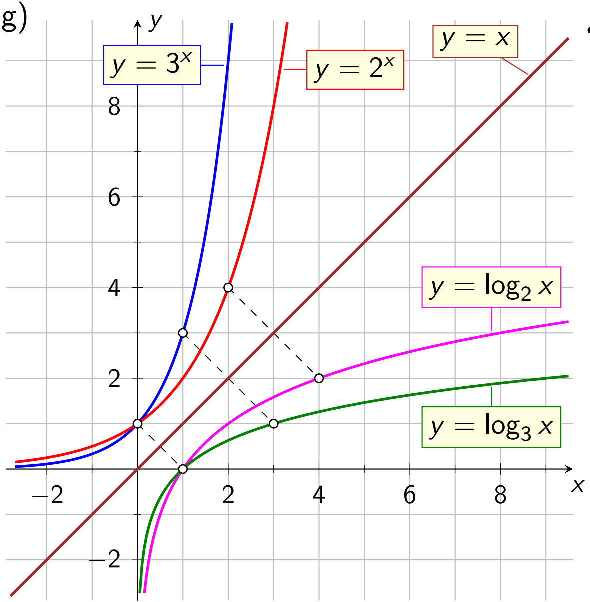
$$\lim_{x \to +\infty} \frac{\log_a x}{kx + \ell} = 0$$

$$\lim_{x \to +\infty} \frac{a^x}{x^\mu} = +\infty$$

$$\lim_{x \to +\infty} \frac{\log_a x}{x^\mu} = 0$$

$$\lim_{x \to +\infty} \frac{3^x}{2^x} = +\infty$$

g)



$a > 1,\ k > 0,\ \ell \in \mathbb{R},\ \mu > 0$

$$\lim_{x\to+\infty} \frac{a^x}{kx+\ell} = +\infty$$

$$\lim_{x\to+\infty} \frac{\log_a x}{kx+\ell} = 0$$

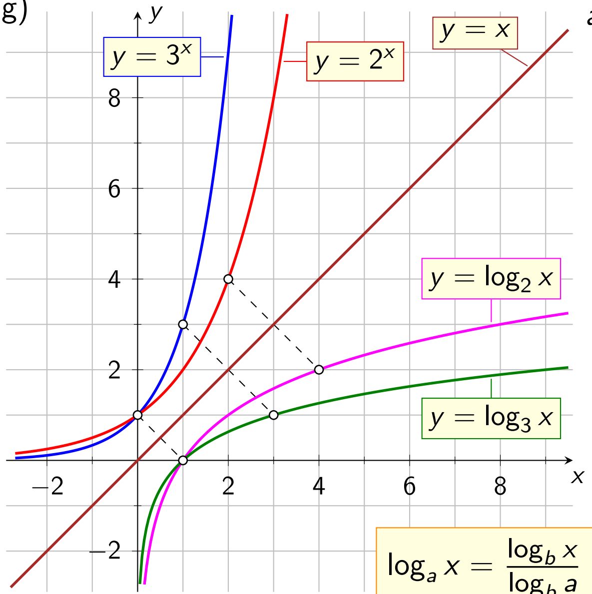
$$\lim_{x\to+\infty} \frac{a^x}{x^\mu} = +\infty$$

$$\lim_{x\to+\infty} \frac{\log_a x}{x^\mu} = 0$$

$$\lim_{x\to+\infty} \frac{3^x}{2^x} = +\infty$$

$$\frac{\log_2 x}{\log_3 x} = \log_2 3$$

g)



$$\log_a x = \frac{\log_b x}{\log_b a}$$

$a > 1,\ k > 0,\ \ell \in \mathbb{R},\ \mu > 0$

$$\lim_{x \to +\infty} \frac{a^x}{kx + \ell} = +\infty$$

$$\lim_{x \to +\infty} \frac{\log_a x}{kx + \ell} = 0$$

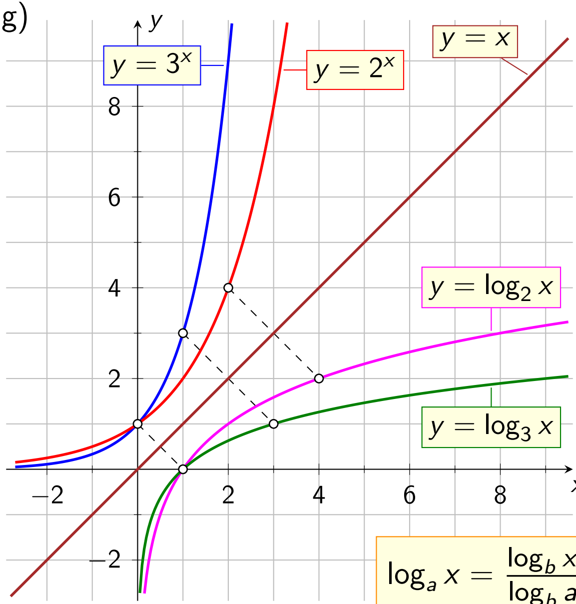
$$\lim_{x \to +\infty} \frac{a^x}{x^\mu} = +\infty$$

$$\lim_{x \to +\infty} \frac{\log_a x}{x^\mu} = 0$$

$$\lim_{x \to +\infty} \frac{3^x}{2^x} = +\infty$$

$$\frac{\log_2 x}{\log_3 x} = \log_2 3$$

g)



$a > 1,\ k > 0,\ \ell \in \mathbb{R},\ \mu > 0$

$$\lim_{x\to+\infty} \frac{a^x}{kx+\ell} = +\infty$$

$$\lim_{x\to+\infty} \frac{\log_a x}{kx+\ell} = 0$$

$$\lim_{x\to+\infty} \frac{a^x}{x^\mu} = +\infty$$

$$\lim_{x\to+\infty} \frac{\log_a x}{x^\mu} = 0$$

$$\lim_{x\to+\infty} \frac{3^x}{2^x} = +\infty$$

$$\log_a x = \frac{\log_b x}{\log_b a}$$

$$\frac{\log_2 x}{\log_3 x} = \log_2 3$$

$$(\log_a x)' = \frac{1}{x \ln a}$$

$$(a^x)' = a^x \ln a$$

treći zadatak

Zadatak 3

Dana su pravila pridruživanja funkcija f i g s

$$f(x) = \log_3 x - 2 \;\; i \;\; g(x) = \sqrt{1-x}.$$

a) *Pronađite inverzne funkcije od f i g te komentirajte na kojim su domenama i kodomenama funkcije f i g bijekcije.*

b) *Nacrtajte na istoj slici graf funkcije f i graf funkcije f^{-1}.*

c) *Nacrtajte na istoj slici graf funkcije g i graf funkcije g^{-1}.*

Rješenje

$$\boxed{y = f(x) \;\Leftrightarrow\; x = f^{-1}(y)}$$

a)

$$f(x) = \log_3 x - 2$$

Rješenje

$$y = f(x) \iff x = f^{-1}(y)$$

a)

$$f(x) = \log_3 x - 2$$

$$y = \log_3 x - 2$$

Rješenje

$$y = f(x) \;\Leftrightarrow\; x = f^{-1}(y)$$

a)

$$f(x) = \log_3 x - 2$$

$$y = \log_3 x - 2$$

$$-\log_3 x =$$

Rješenje

$$\boxed{y = f(x) \;\Leftrightarrow\; x = f^{-1}(y)}$$

a)

$$f(x) = \log_3 x - 2$$

$$y = \log_3 x - 2$$

$$-\log_3 x = -y - 2$$

Rješenje

$$\boxed{y = f(x) \;\Leftrightarrow\; x = f^{-1}(y)}$$

a)

$$f(x) = \log_3 x - 2$$

$$y = \log_3 x - 2$$

$$-\log_3 x = -y - 2 \,/\cdot(-1)$$

Rješenje

$$\boxed{y = f(x) \;\Leftrightarrow\; x = f^{-1}(y)}$$

a)

$$f(x) = \log_3 x - 2$$

$$\begin{aligned} y &= \log_3 x - 2 \\ -\log_3 x &= -y - 2 \,/\cdot(-1) \\ \log_3 x &= y + 2 \end{aligned}$$

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

$$\boxed{y = f(x) \Leftrightarrow x = f^{-1}(y)}$$

a)

$$f(x) = \log_3 x - 2$$

$$y = \log_3 x - 2$$

$$-\log_3 x = -y - 2 \,/\cdot(-1)$$

$$\log_3 x = y + 2$$

Rješenje

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Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

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$$f^{-1}(y) = 3^{y+2}$$

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

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$$f^{-1}(y) = 3^{y+2}$$

$$f^{-1}(x) = 3^{x+2}$$

Rješenje

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Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

$$y = f(x) \;\Leftrightarrow\; x = f^{-1}(y)$$

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$$f(x) = \log_3 x - 2$$

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$$\log_3 x = y + 2$$

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f :

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

$$y = f(x) \Leftrightarrow x = f^{-1}(y)$$

a)

$$f(x) = \log_3 x - 2$$

$$y = \log_3 x - 2$$

$$-\log_3 x = -y - 2 \,/\cdot(-1)$$

$$\log_3 x = y + 2$$

$$x = 3^{y+2}$$

$$f^{-1}(y) = 3^{y+2}$$

$$\boxed{f^{-1}(x) = 3^{x+2}}$$

$$f : \langle 0, +\infty \rangle$$

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

$$y = f(x) \;\Leftrightarrow\; x = f^{-1}(y)$$

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$$f(x) = \log_3 x - 2$$

$$\begin{aligned} y &= \log_3 x - 2 \\ -\log_3 x &= -y - 2 \,/\cdot(-1) \\ \log_3 x &= y + 2 \\ x &= 3^{y+2} \end{aligned}$$

$$f^{-1}(y) = 3^{y+2}$$

$$\boxed{f^{-1}(x) = 3^{x+2}}$$

$$f : \langle 0, +\infty\rangle \to$$

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

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$$\boxed{f^{-1}(x) = 3^{x+2}}$$

$$f : \langle 0, +\infty\rangle \to \mathbb{R}$$

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

$$y = f(x) \;\Leftrightarrow\; x = f^{-1}(y)$$

a)

$$f(x) = \log_3 x - 2$$

$$\begin{aligned}
y &= \log_3 x - 2 \\
-\log_3 x &= -y - 2 \,/\cdot(-1) \\
\log_3 x &= y + 2 \\
x &= 3^{y+2}
\end{aligned}$$

$$f^{-1}(y) = 3^{y+2}$$

$$\boxed{f^{-1}(x) = 3^{x+2}}$$

$$f : \langle 0, +\infty\rangle \to \mathbb{R}$$

$$f^{-1} :$$

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

$$y = f(x) \;\Leftrightarrow\; x = f^{-1}(y)$$

a)

$$f(x) = \log_3 x - 2$$

$$\begin{aligned} y &= \log_3 x - 2 \\ -\log_3 x &= -y - 2 \,\big/ \cdot (-1) \\ \log_3 x &= y + 2 \\ x &= 3^{y+2} \end{aligned}$$

$$f^{-1}(y) = 3^{y+2}$$

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$$f : \langle 0, +\infty\rangle \to \mathbb{R}$$

$$f^{-1} : \mathbb{R}$$

Rješenje

$\log_a x = b \rightsquigarrow x = a^b$

$y = f(x) \iff x = f^{-1}(y)$

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$$f : \langle 0, +\infty\rangle \to \mathbb{R}$$

$$f^{-1} : \mathbb{R} \to$$

Rješenje

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$$f : \langle 0, +\infty\rangle \to \mathbb{R}$$

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Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

$$y = f(x) \Leftrightarrow x = f^{-1}(y)$$

a)

$$f(x) = \log_3 x - 2$$

$$g(x) = \sqrt{1-x}$$

$$y = \log_3 x - 2$$

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$$g(x) = \sqrt{1-x}$$

$$y = \sqrt{1-x}$$

Rješenje

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$$g(x) = \sqrt{1-x}$$

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Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

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$$g(x) = \sqrt{1-x}$$

$$y = \sqrt{1-x} \,/^2$$

uz uvjet

$y \geqslant 0$

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

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$$f : \langle 0, +\infty\rangle \to \mathbb{R}$$

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$$g(x) = \sqrt{1-x}$$

$$y = \sqrt{1-x} \,/^2$$

uz uvjet

$$y \geqslant 0$$

$$-5 = 5$$

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

$$y = f(x) \;\Leftrightarrow\; x = f^{-1}(y)$$

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$$f : \langle 0, +\infty\rangle \to \mathbb{R}$$

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$$g(x) = \sqrt{1-x}$$

$$y = \sqrt{1-x} \,/^2$$

uz uvjet

$$y \geqslant 0$$

laž

$$-5 = 5$$

Rješenje

$\log_a x = b \rightsquigarrow x = a^b$

$y = f(x) \;\Leftrightarrow\; x = f^{-1}(y)$

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$$g(x) = \sqrt{1-x}$$

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uz uvjet

$$y \geqslant 0$$

laž

$$-5 = 5\,/^2$$

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

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$$g(x) = \sqrt{1-x}$$

$$y = \sqrt{1-x} \,/^2$$

uz uvjet

$$y \geqslant 0$$

laž

$$-5 = 5 \,/^2$$

$$25 = 25$$

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

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uz uvjet

$$y \geqslant 0$$

laž

$$-5 = 5 \,/^2$$

$$25 = 25$$

istina

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

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$$g(x) = \sqrt{1-x}$$

$$y = \sqrt{1-x} \,/^2$$

uz uvjet

$$y^2 = 1 - x \qquad y \geqslant 0$$

laž

$$-5 = 5 \,/^2$$

$$25 = 25$$

istina

Rješenje

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$$g(x) = \sqrt{1-x}$$

$$y = \sqrt{1-x} \;/^2$$

uz uvjet

$$y^2 = 1 - x \qquad y \geqslant 0$$

$$x =$$

laž

$$-5 = 5 \;/^2$$

$$25 = 25$$

istina

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

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uz uvjet

$$y^2 = 1 - x \qquad y \geqslant 0$$

$$x = 1 - y^2$$

laž

$$-5 = 5 \,/^2$$

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istina

Rješenje

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$$g(x) = \sqrt{1-x}$$

$$y = \sqrt{1-x} \,/^2$$

uz uvjet

$$y^2 = 1 - x \qquad y \geqslant 0$$

$$x = 1 - y^2$$

$$g^{-1}(y) = 1 - y^2$$

laž

$$-5 = 5 \,/^2$$

$$25 = 25$$

istina

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

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$$g(x) = \sqrt{1-x}$$

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uz uvjet

$$y \geqslant 0$$

$$y^2 = 1 - x$$

$$x = 1 - y^2$$

$$g^{-1}(y) = 1 - y^2$$

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laž

$$-5 = 5 \,/^2$$

$$25 = 25$$

istina

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

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$$g(x) = \sqrt{1-x}$$

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uz uvjet

$$y \geqslant 0$$

$$y^2 = 1 - x$$

$$x = 1 - y^2$$

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$$\boxed{g^{-1}(x) = 1 - x^2}$$

laž

$$-5 = 5 \;/^2$$

$$25 = 25$$

istina

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

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$$g(x) = \sqrt{1-x}$$

$$y = \sqrt{1-x} \;/^2$$

uz uvjet

$$y \geqslant 0$$

$$y^2 = 1 - x$$

$$x = 1 - y^2$$

$$g^{-1}(y) = 1 - y^2$$

$$\boxed{g^{-1}(x) = 1 - x^2}$$

laž

$$-5 = 5 \;/^2$$

$$25 = 25$$

istina

g :

Rješenje

$\log_a x = b \rightsquigarrow x = a^b$

$y = f(x) \;\Leftrightarrow\; x = f^{-1}(y)$

a)

$$f(x) = \log_3 x - 2$$

$$y = \log_3 x - 2$$

$$-\log_3 x = -y - 2 \,/\cdot(-1)$$

$$\log_3 x = y + 2$$

$$x = 3^{y+2}$$

$f^{-1}($

$f^{-1}($

$$1 - x \geqslant 0$$

$$f : \langle 0, +\infty\rangle \to \mathbb{R}$$

$$f^{-1} : \mathbb{R} \to \langle 0, +\infty\rangle$$

$$g(x) = \sqrt{1-x}$$

$$y = \sqrt{1-x} \,/^2$$

uz uvjet

$$y^2 = 1 - x \qquad y \geqslant 0$$

$$x = 1 - y^2$$

laž

$$-5 = 5 \,/^2$$

$$25 = 25$$

istina

$$g^{-1}(y) = 1 - y^2$$

$$\boxed{g^{-1}(x) = 1 - x^2}$$

$g :$

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

$$y = f(x) \;\Leftrightarrow\; x = f^{-1}(y)$$

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$$f(x) = \log_3 x - 2$$

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$$\log_3 x = y + 2$$

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$f^{-1}($

$\boxed{f^{-1}(}$

$$1 - x \geqslant 0$$

$$-x \geqslant -1$$

$$f : \langle 0, +\infty\rangle \to \mathbb{R}$$

$$f^{-1} : \mathbb{R} \to \langle 0, +\infty\rangle$$

$$g(x) = \sqrt{1-x}$$

$$y = \sqrt{1-x} \,/^2$$

uz uvjet $y \geqslant 0$

$$y^2 = 1 - x$$

$$x = 1 - y^2$$

$$g^{-1}(y) = 1 - y^2$$

$$\boxed{g^{-1}(x) = 1 - x^2}$$

laž

$$-5 = 5 \,/^2$$

$$25 = 25$$

istina

$g :$

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

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$f^{-1}($

$\boxed{f^{-1}(}$

$$1 - x \geqslant 0$$

$$-x \geqslant -1 \,/\cdot(-1)$$

$$f : \langle 0, +\infty\rangle \to \mathbb{R}$$

$$f^{-1} : \mathbb{R} \to \langle 0, +\infty\rangle$$

$$g(x) = \sqrt{1-x}$$

$$y = \sqrt{1-x}\,/^2$$

uz uvjet

$$y \geqslant 0$$

$$y^2 = 1 - x$$

$$x = 1 - y^2$$

$$g^{-1}(y) = 1 - y^2$$

$$\boxed{g^{-1}(x) = 1 - x^2}$$

laž

$$-5 = 5\,/^2$$

$$25 = 25$$

istina

$g :$

Rješenje

$$\log_a x = b \rightsquigarrow x = a^b$$

$$y = f(x) \;\Leftrightarrow\; x = f^{-1}(y)$$

a)

$$f(x) = \log_3 x - 2$$

$$y = \log_3 x - 2$$

$$-\log_3 x = -y - 2 \;/\cdot(-1)$$

$$\log_3 x = y + 2$$

$$x = 3^{y+2}$$

$f^{-1}($

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$$1 - x \geqslant 0$$

$$-x \geqslant -1 \;/\cdot(-1)$$

$$x \leqslant 1$$

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$y \geqslant 0$

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istina

$$g : \langle -\infty, 1]$$

Rješenje

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$$y = f(x) \;\Leftrightarrow\; x = f^{-1}(y)$$

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Rješenje

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$$g(x) = \sqrt{1-x}$$

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uz uvjet

$$y^2 = 1 - x \qquad y \geqslant 0$$

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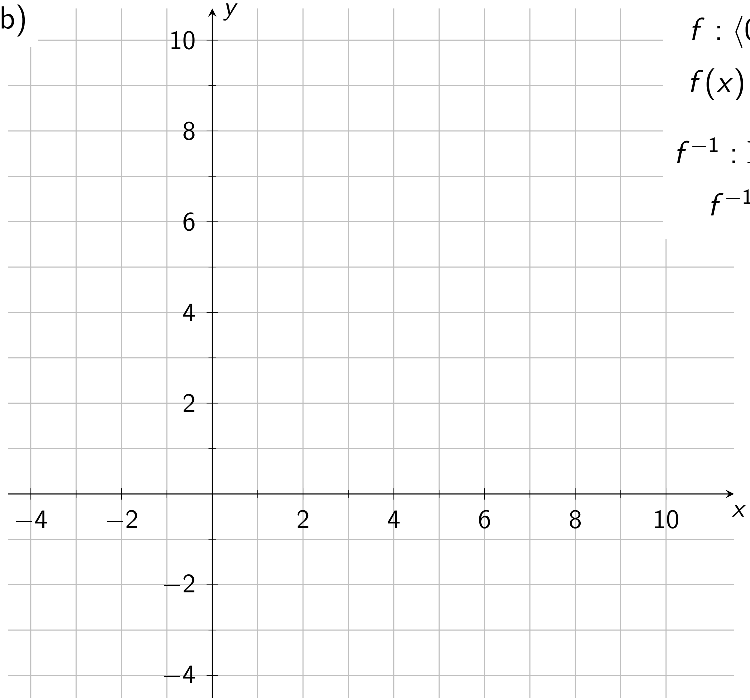
$$g^{-1} : [0, +\infty\rangle \to \langle -\infty, 1]$$

b)



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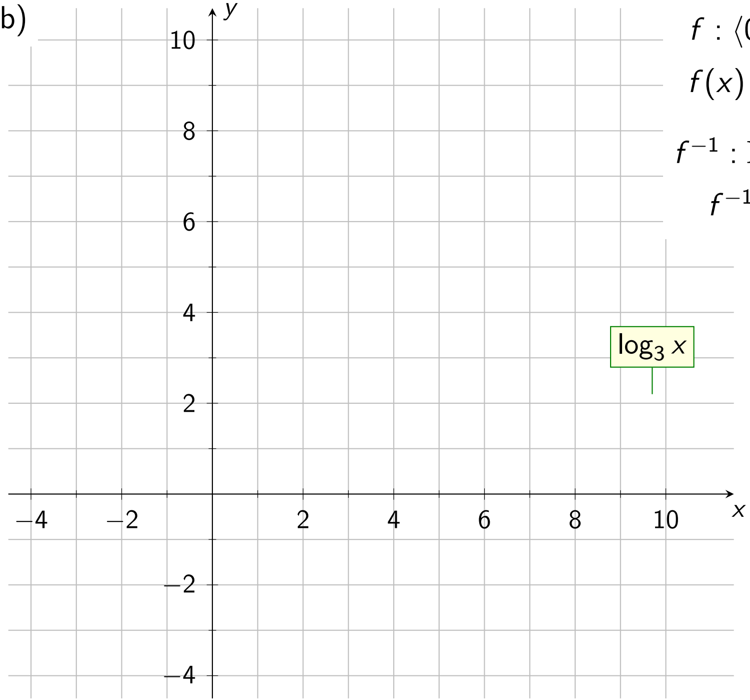

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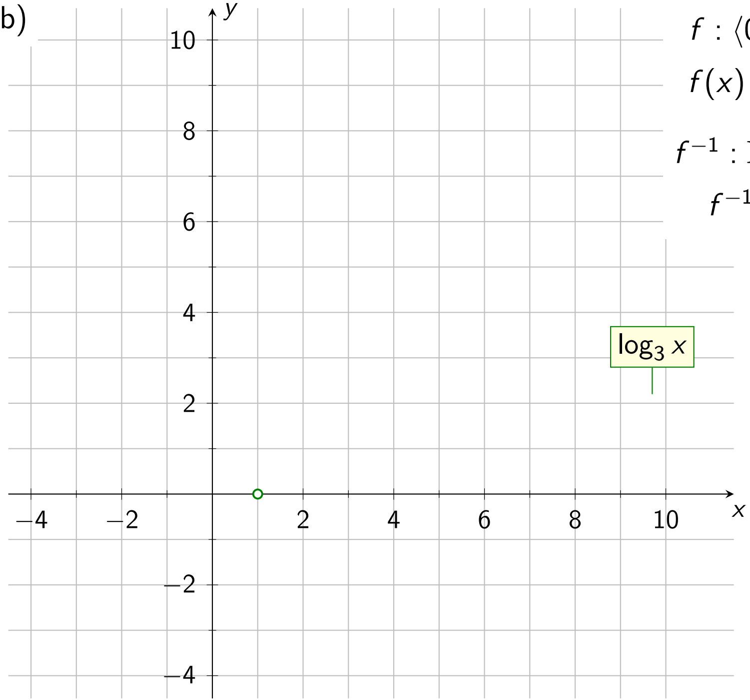

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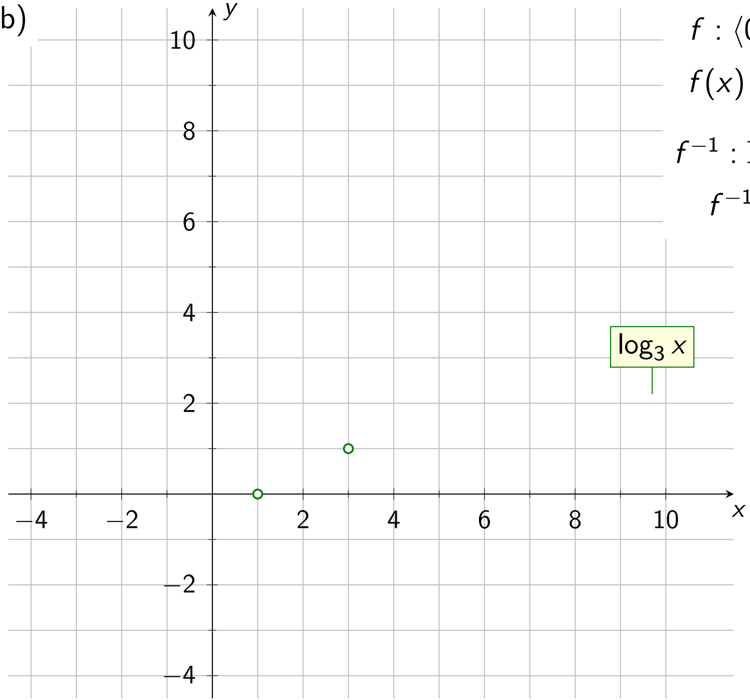

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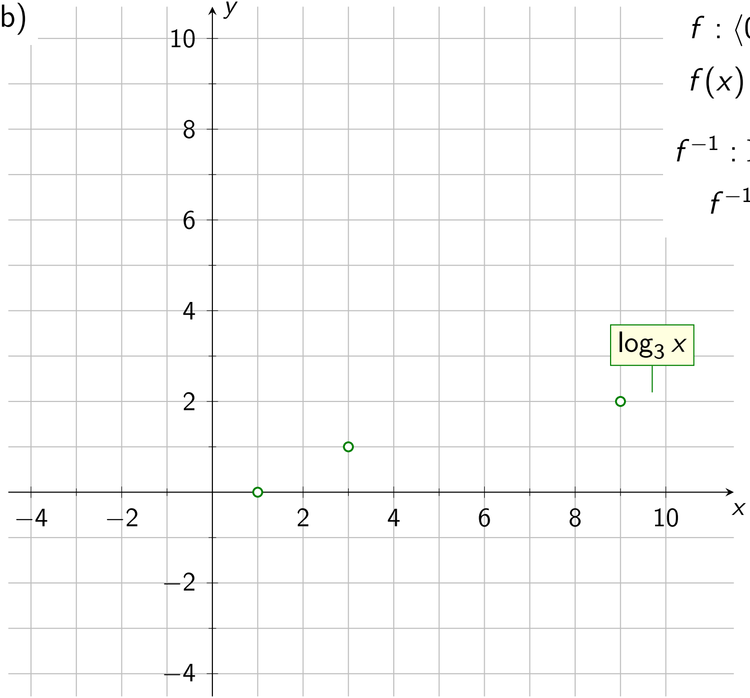

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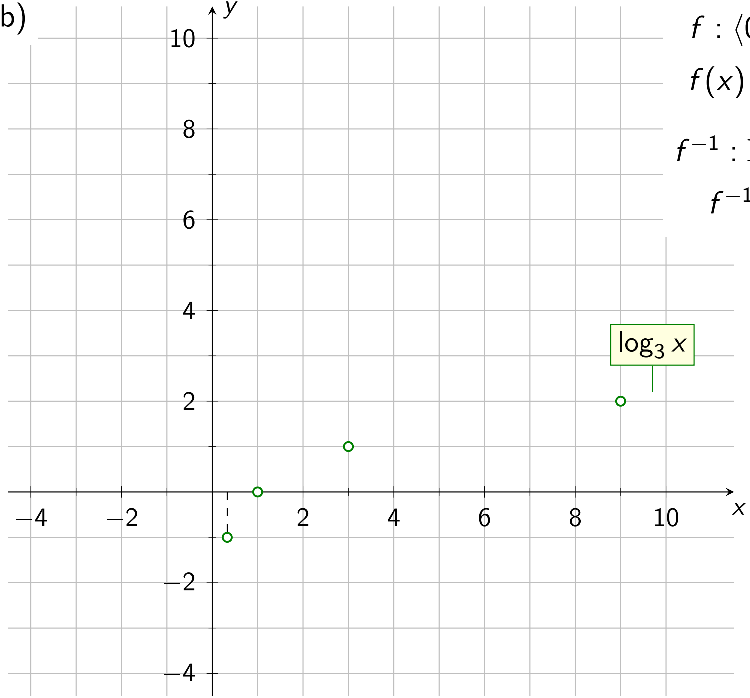

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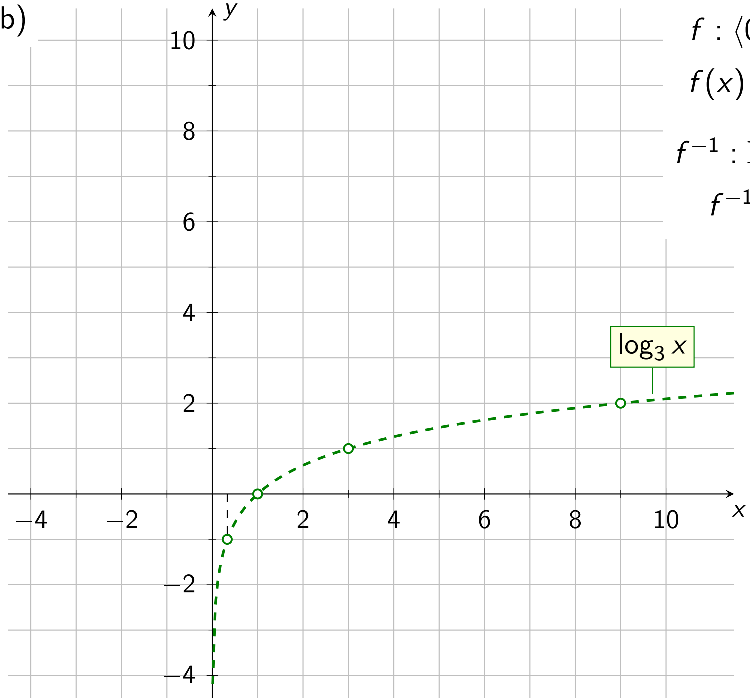

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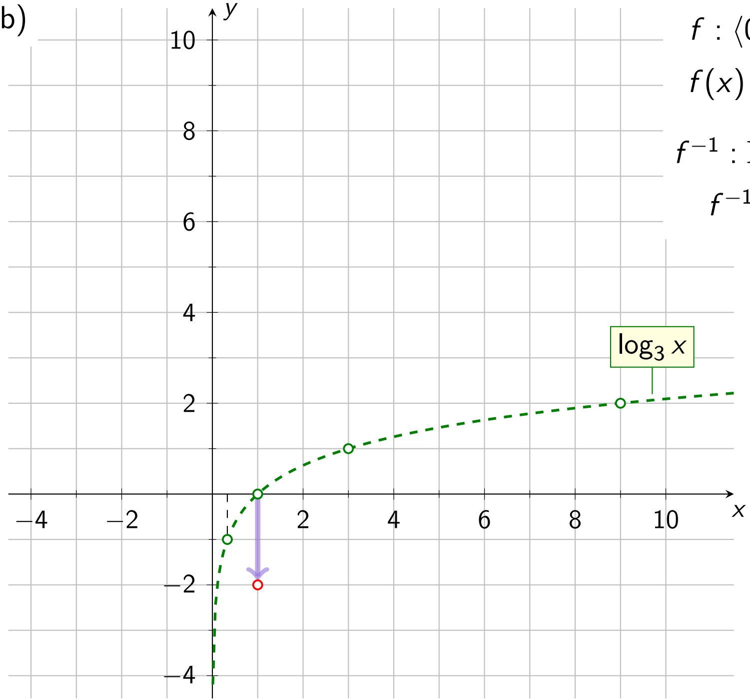

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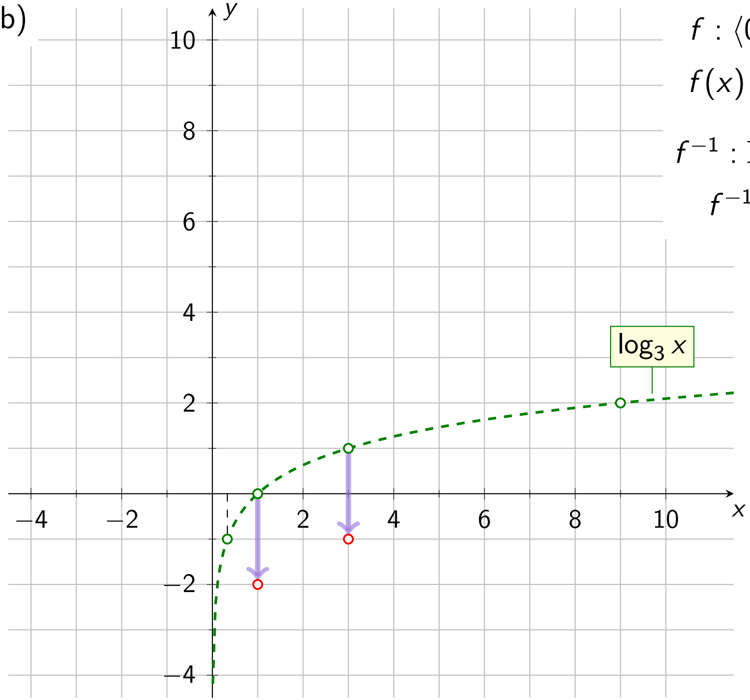

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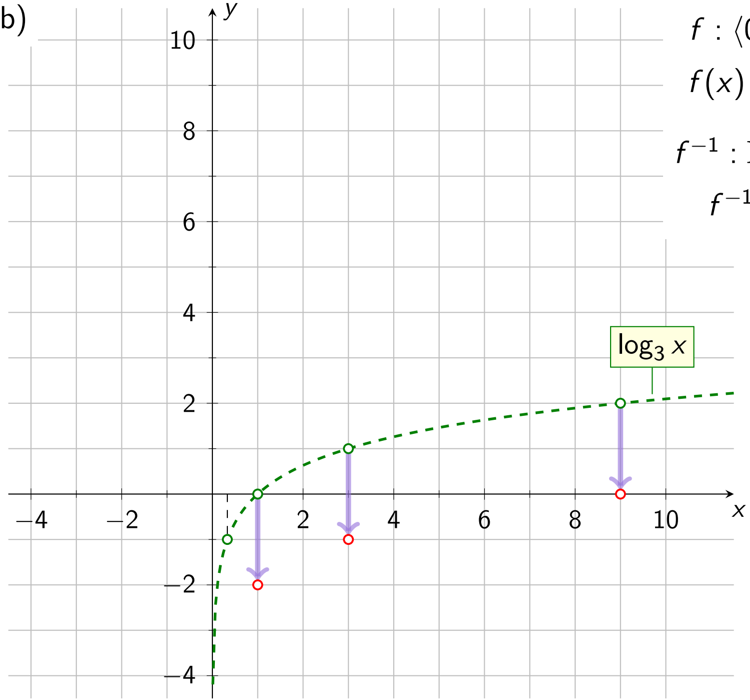

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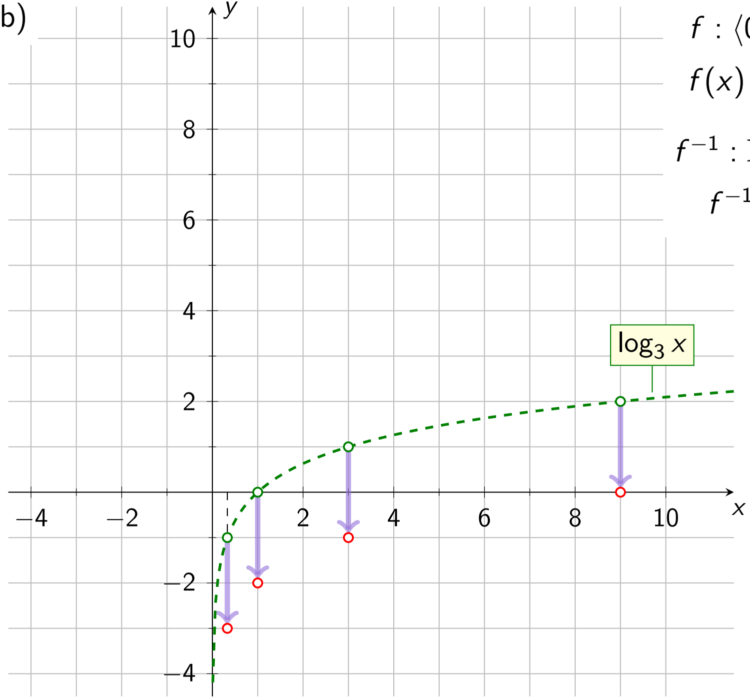

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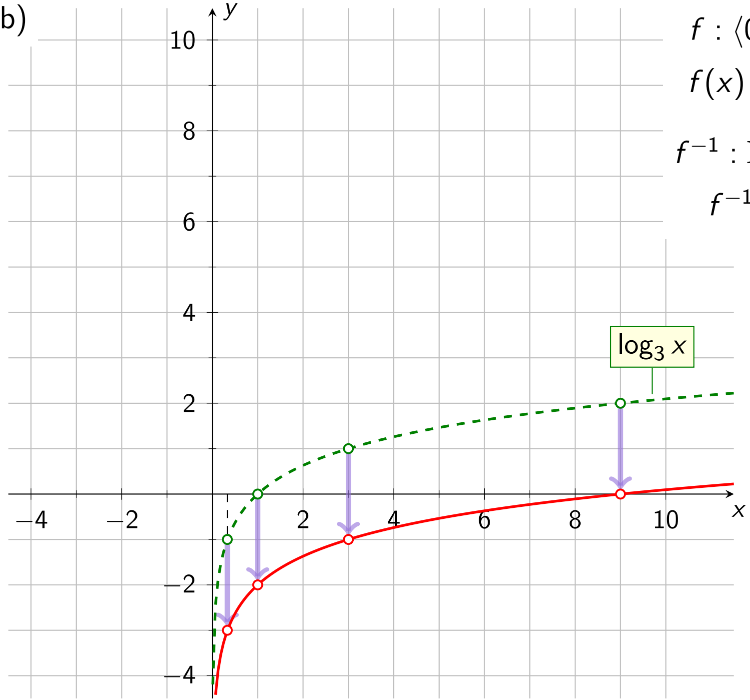

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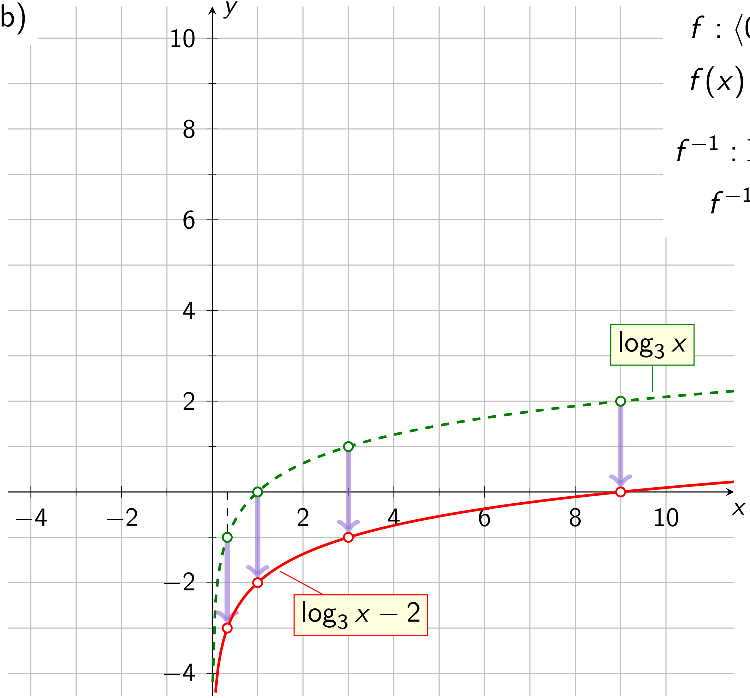

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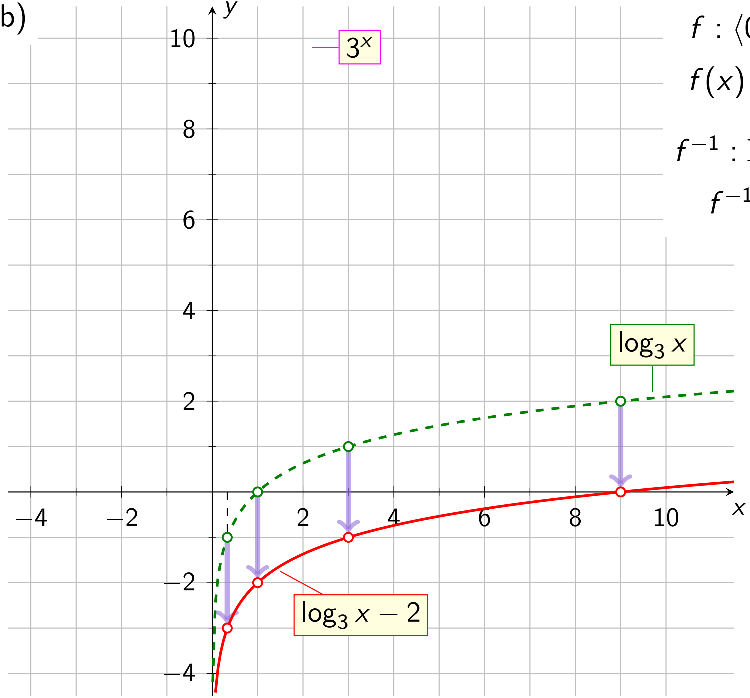

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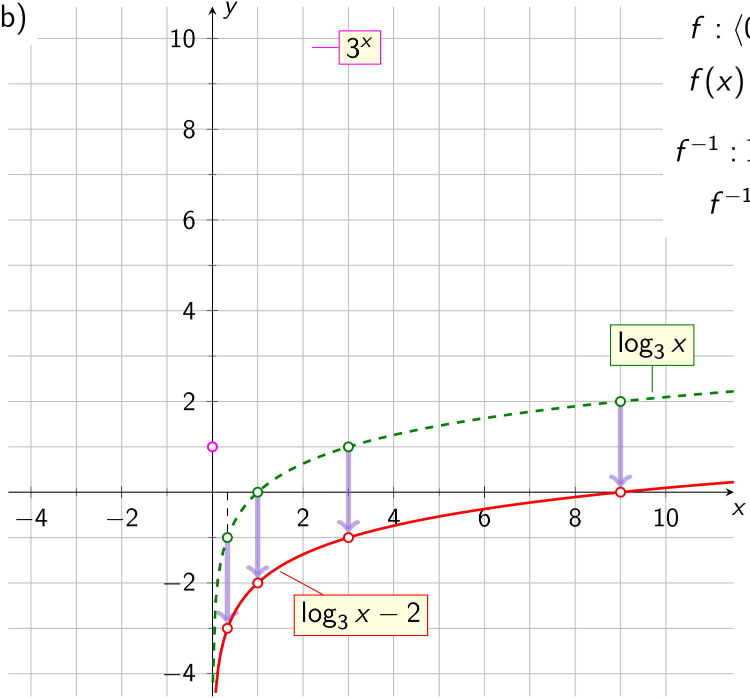

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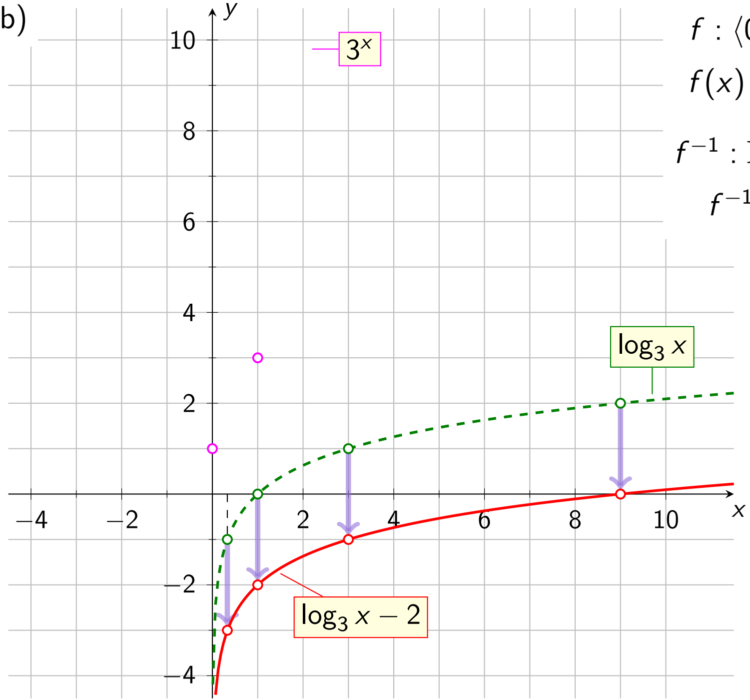

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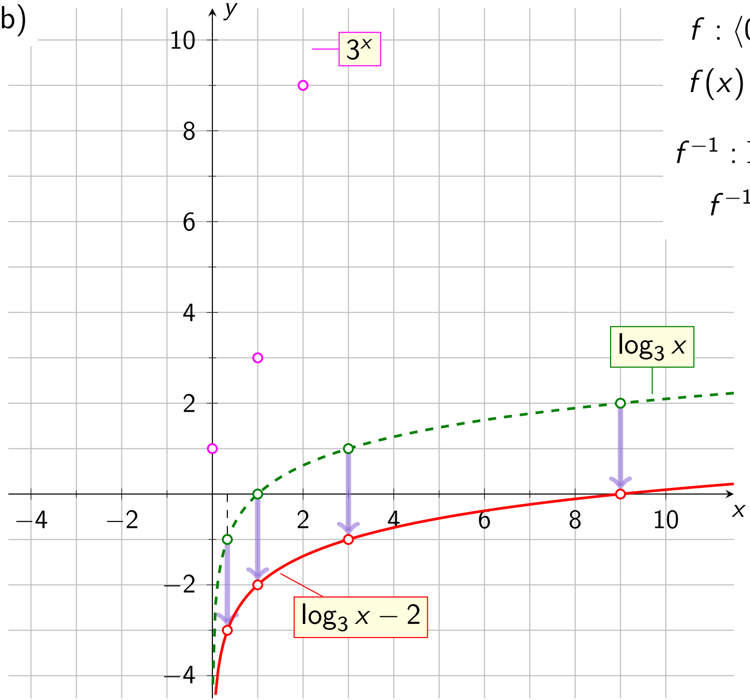

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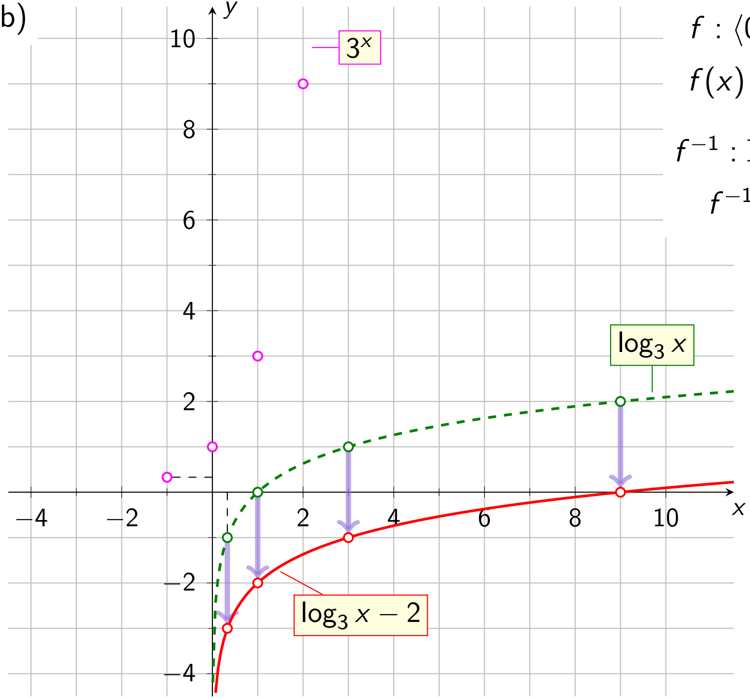

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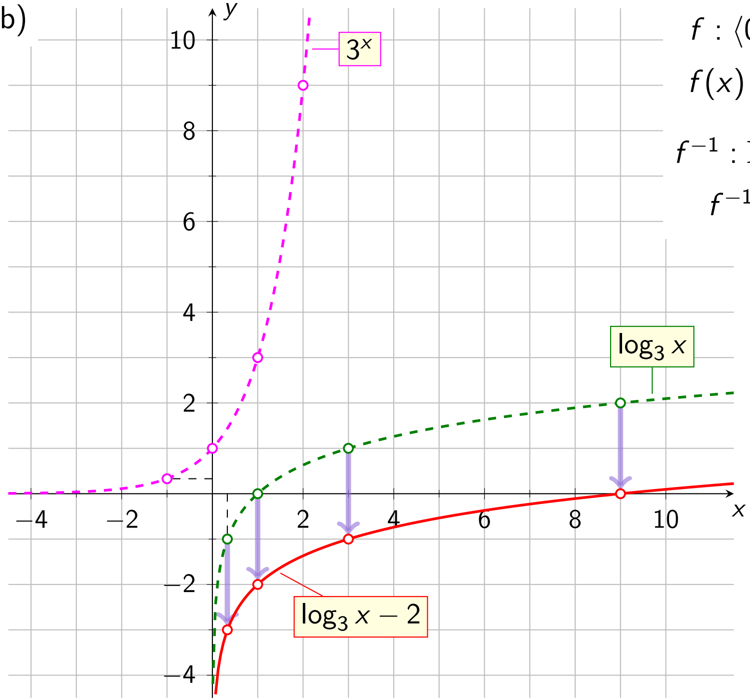

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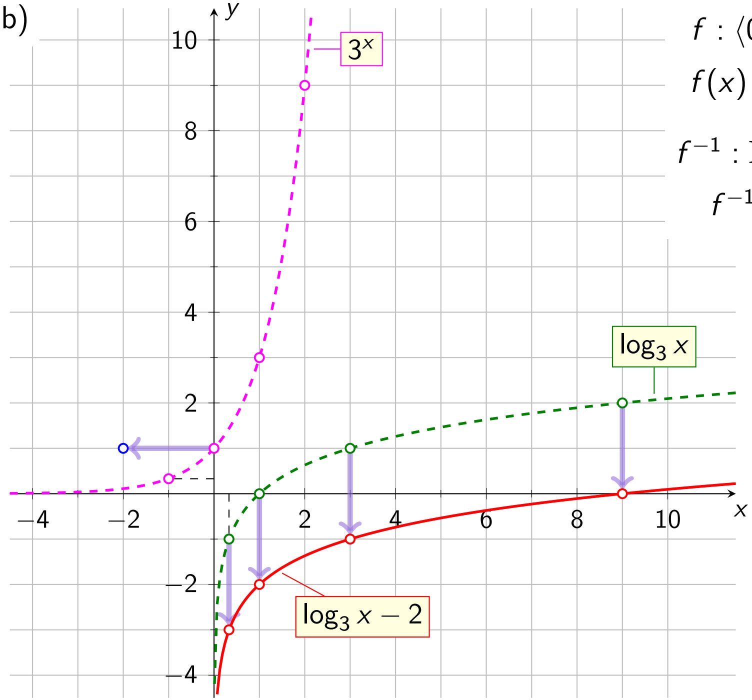

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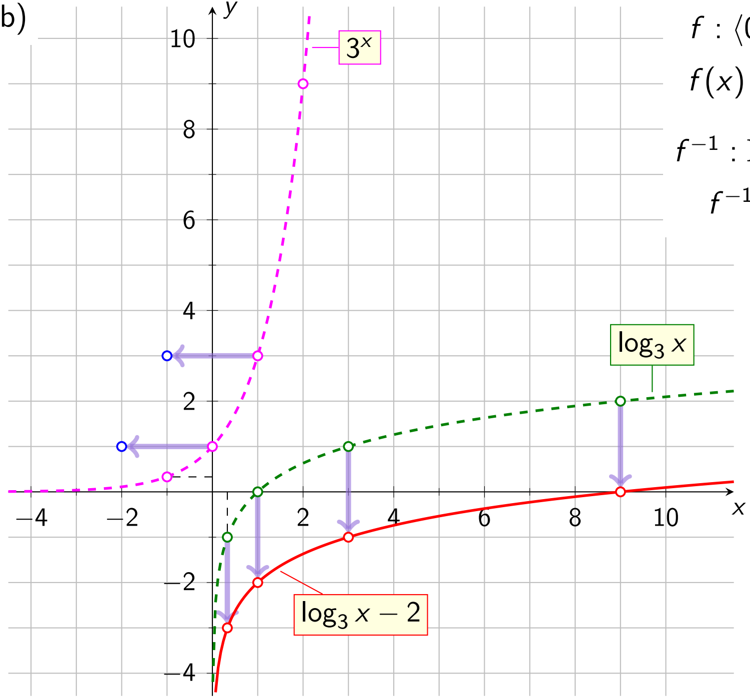

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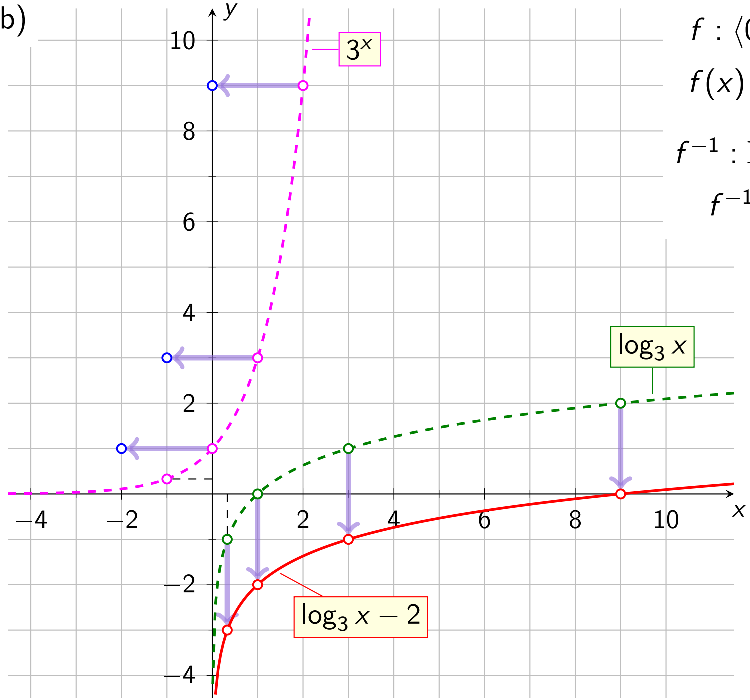

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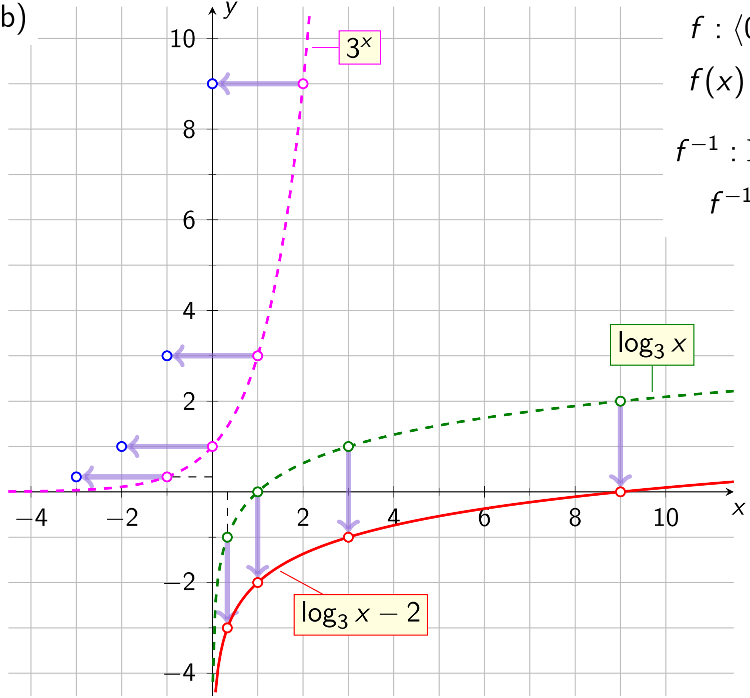

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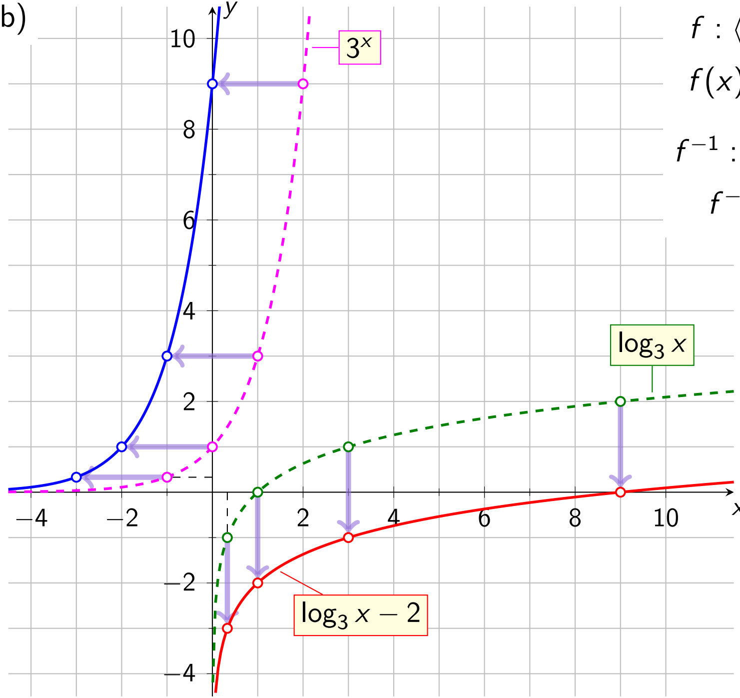

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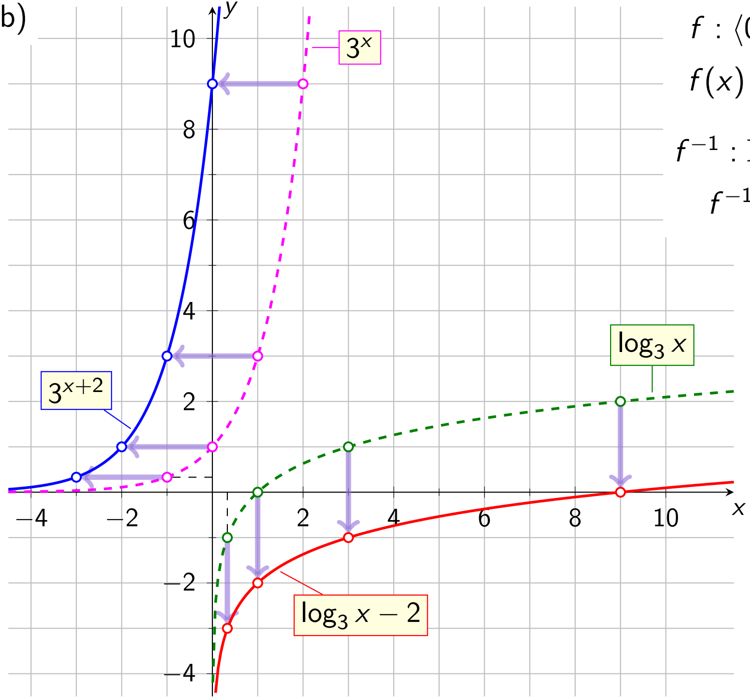

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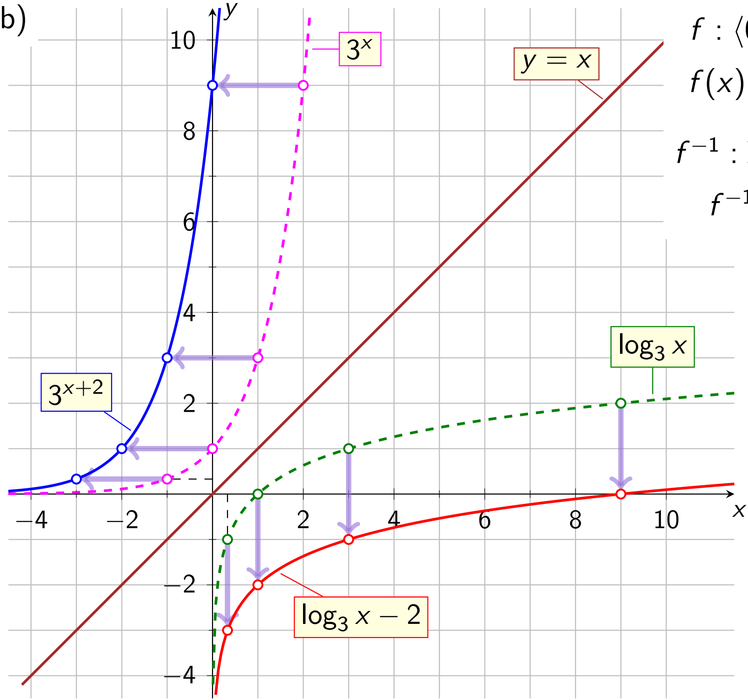

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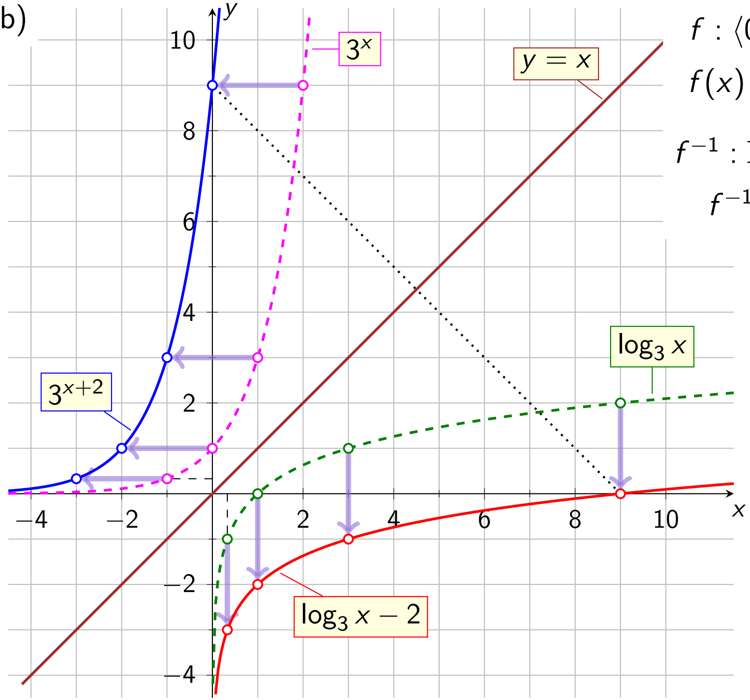

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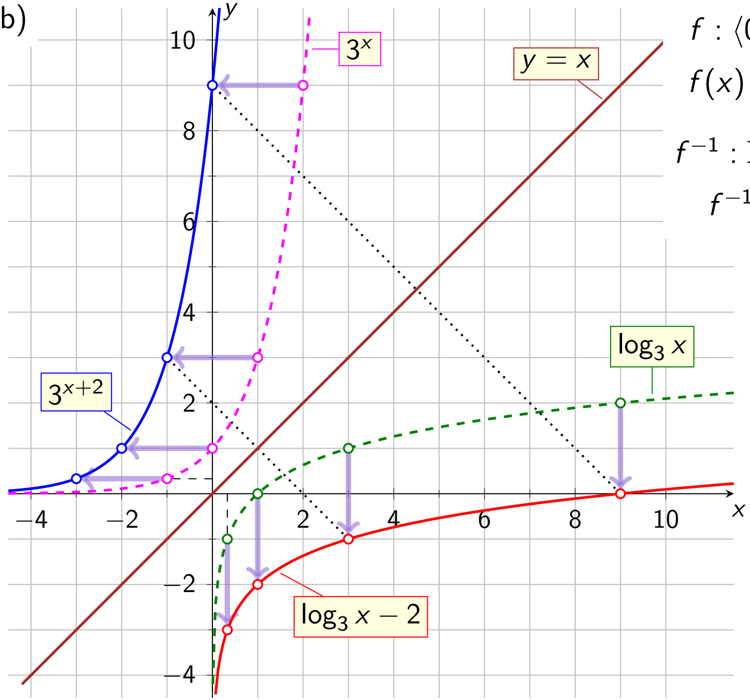

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$f(x) = \log_3 x - 2$

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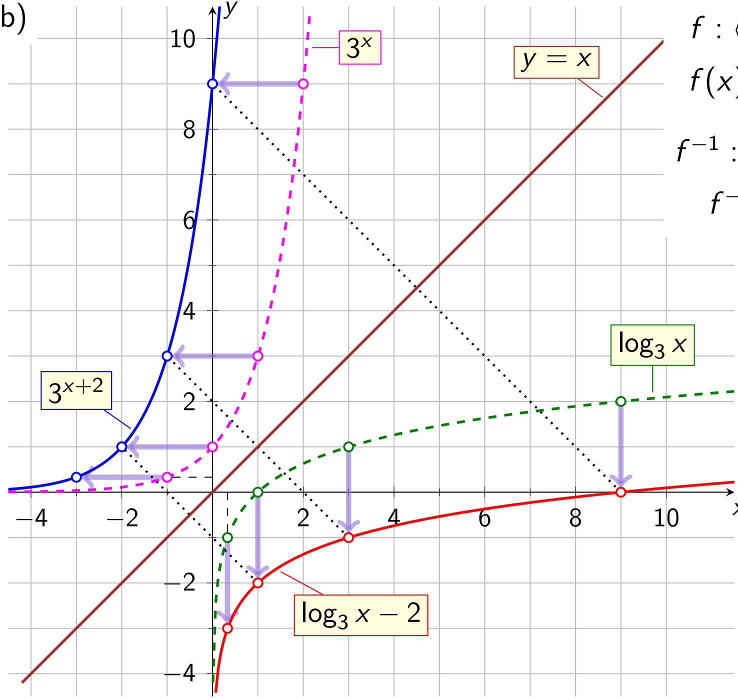

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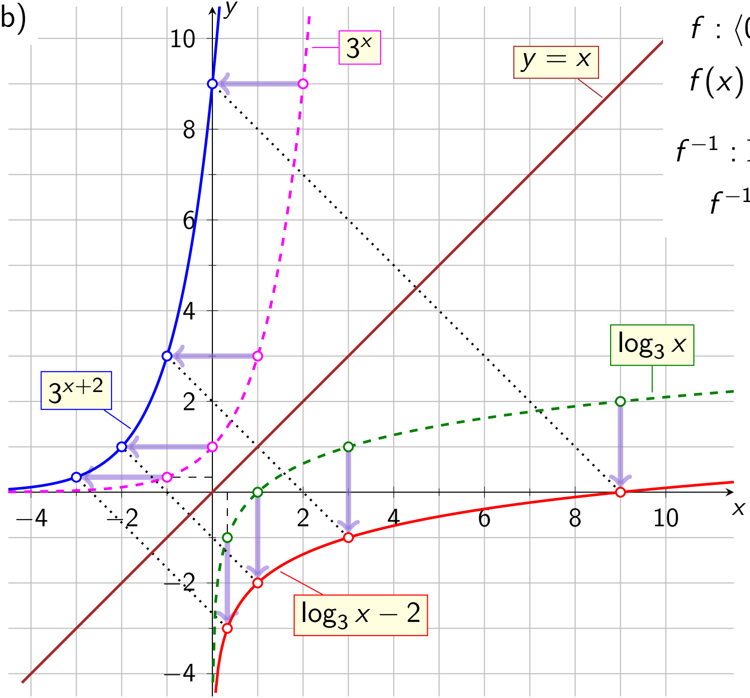

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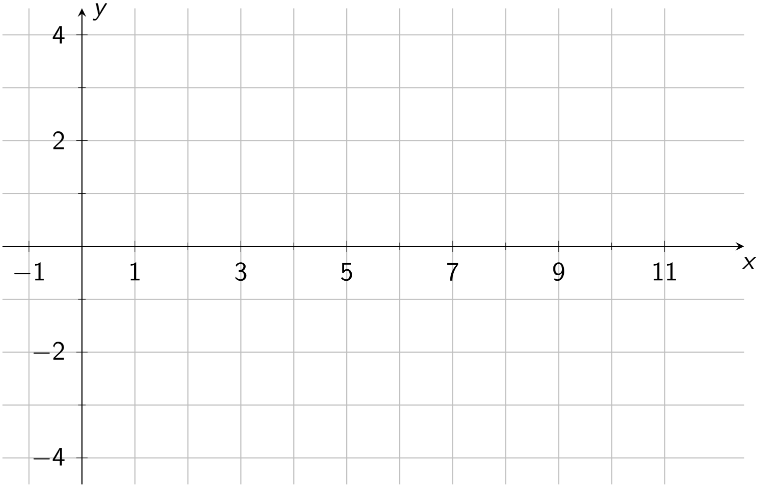
Graf funkcije $h(x) = \log_3(x-2)$



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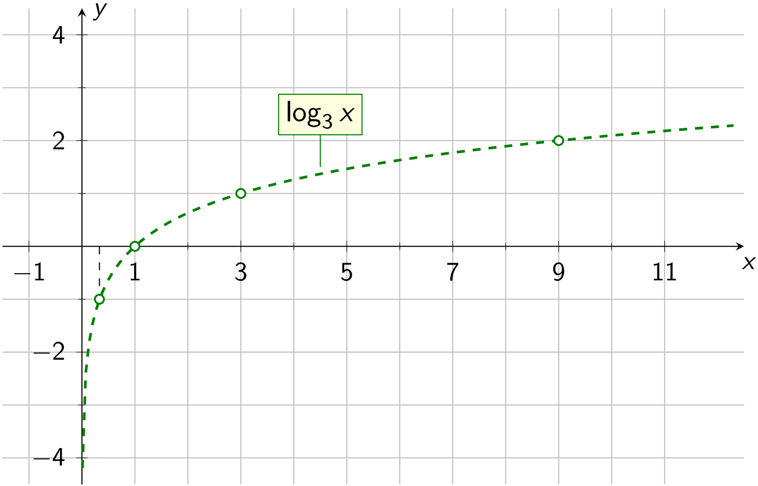

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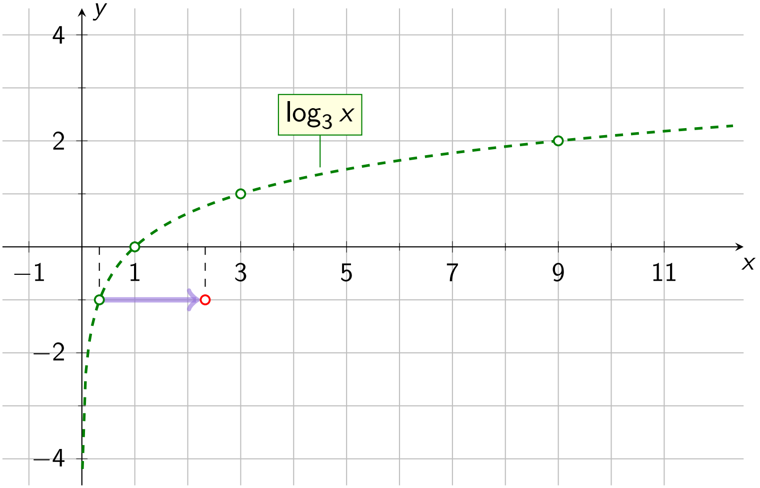

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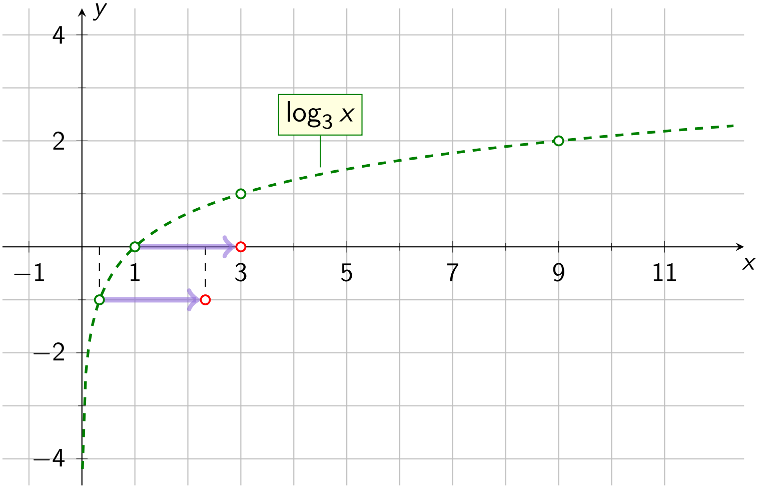

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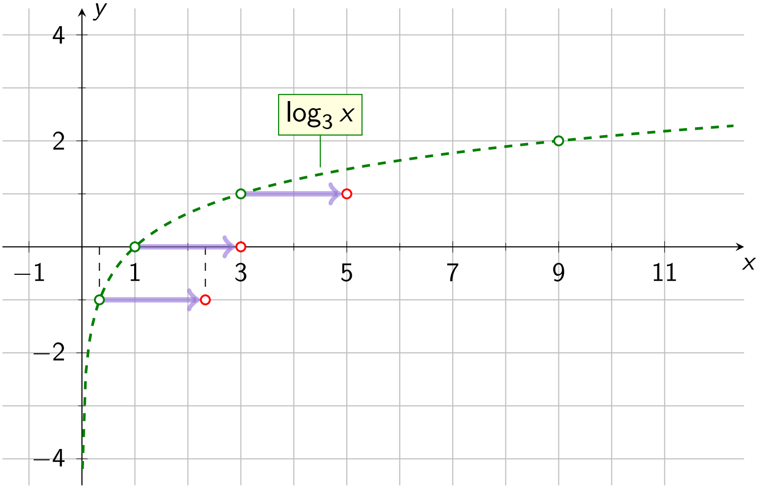

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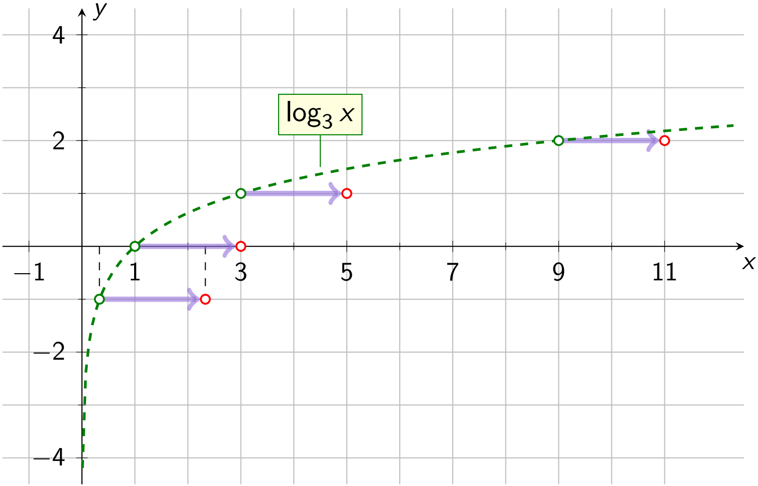

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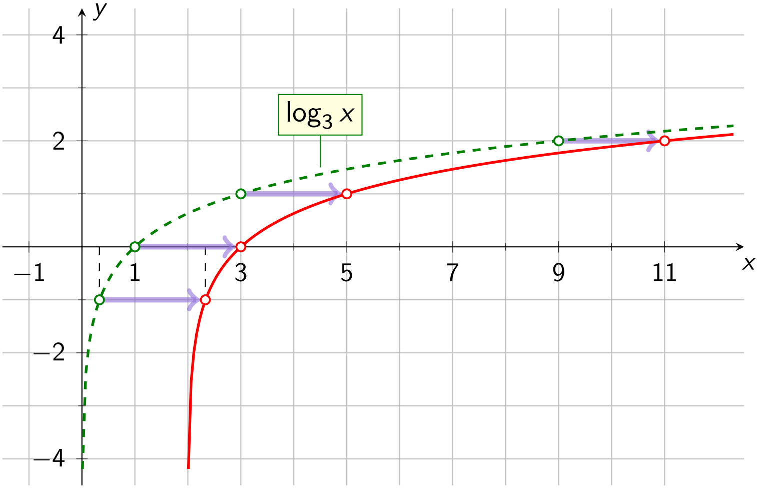

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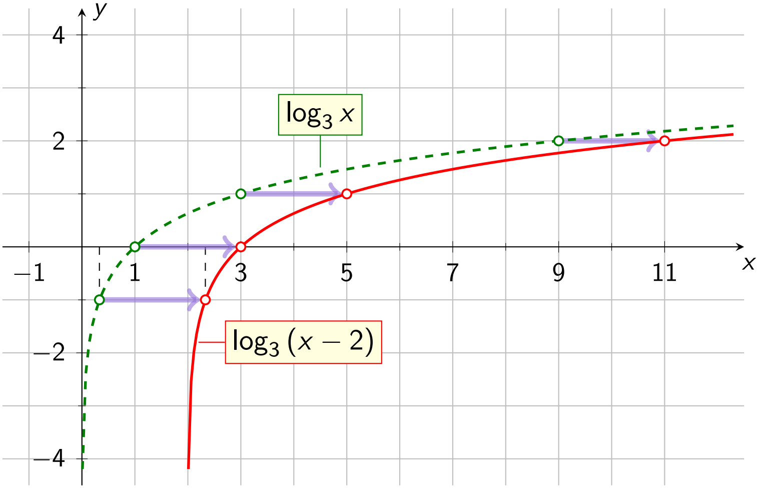

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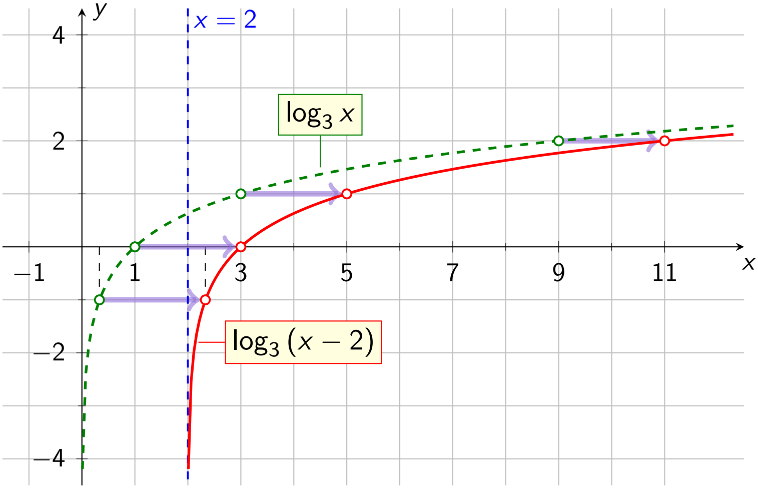
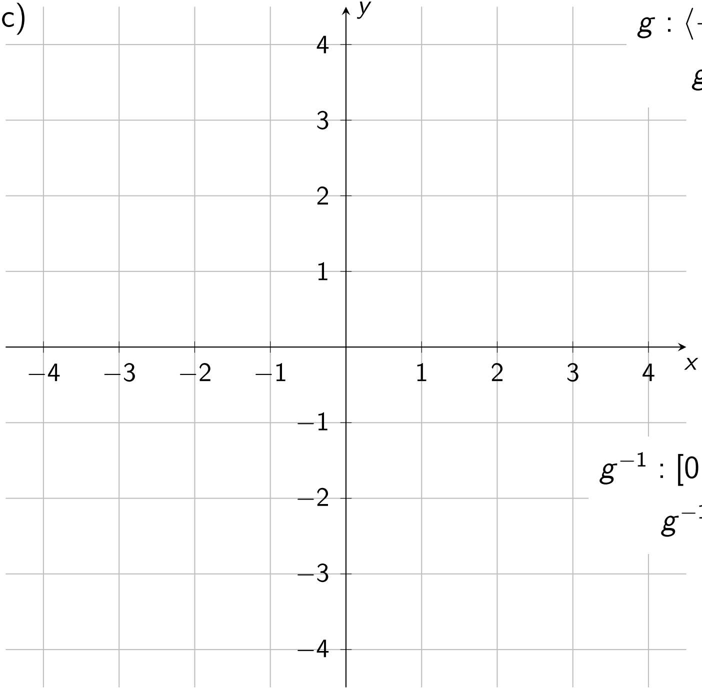


c)



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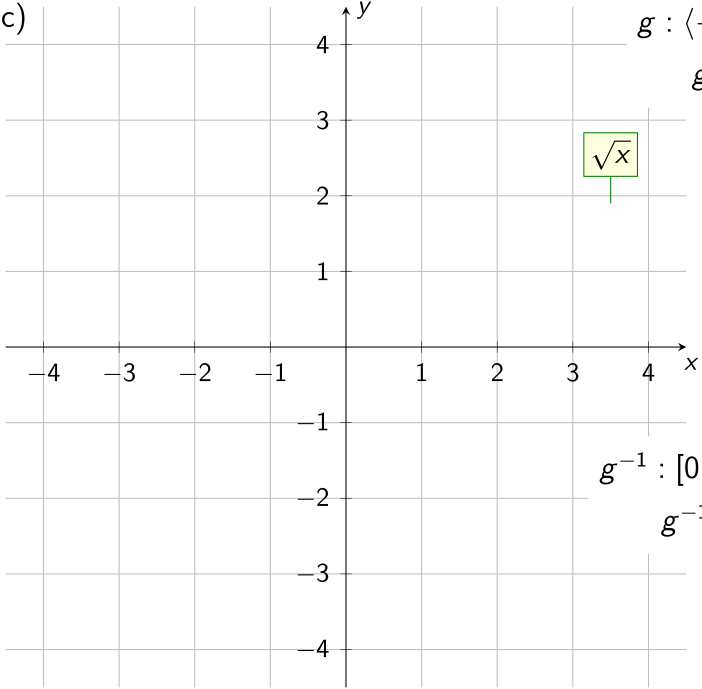

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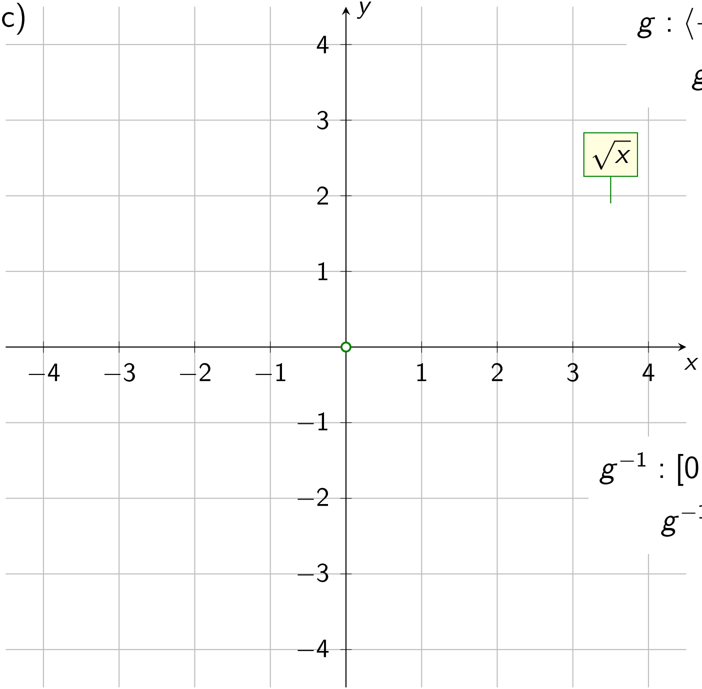

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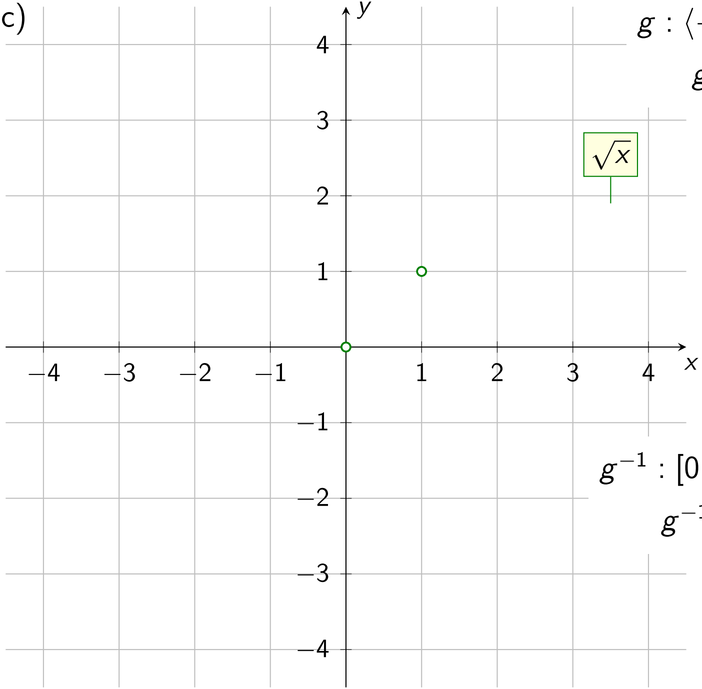

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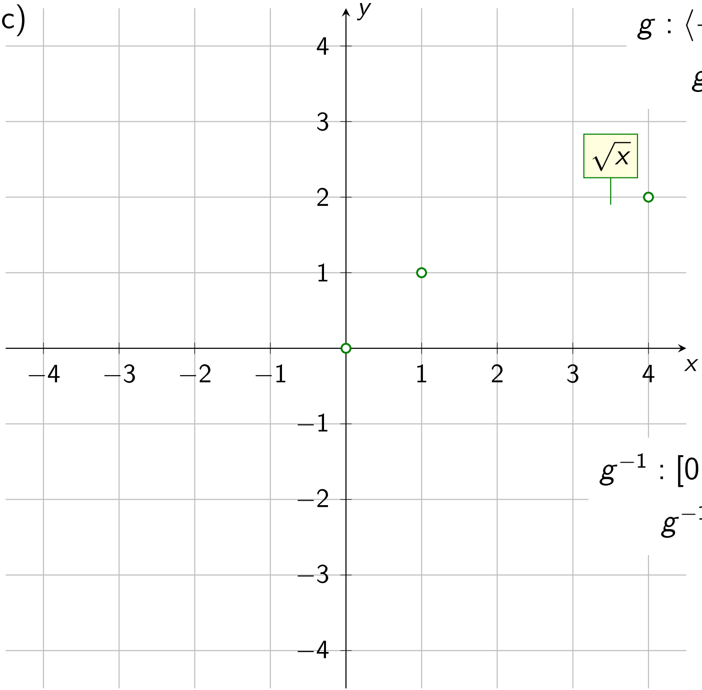

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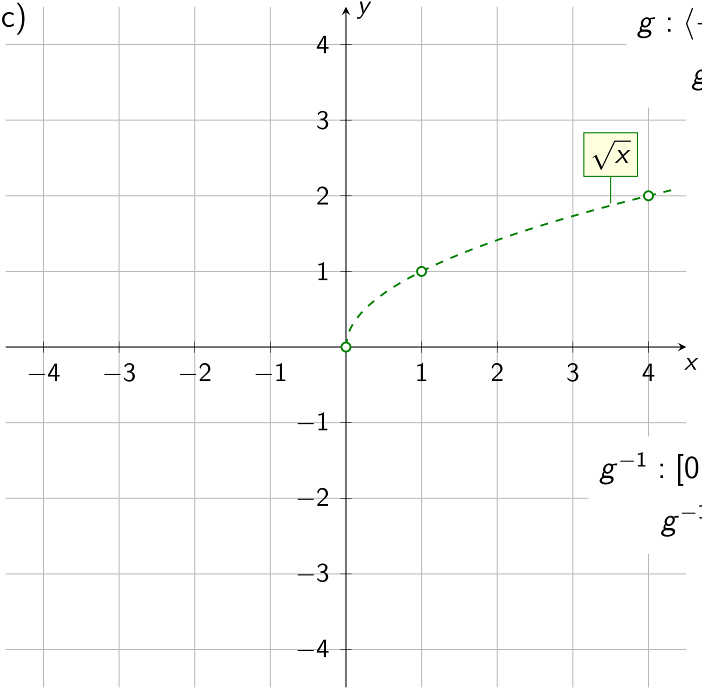

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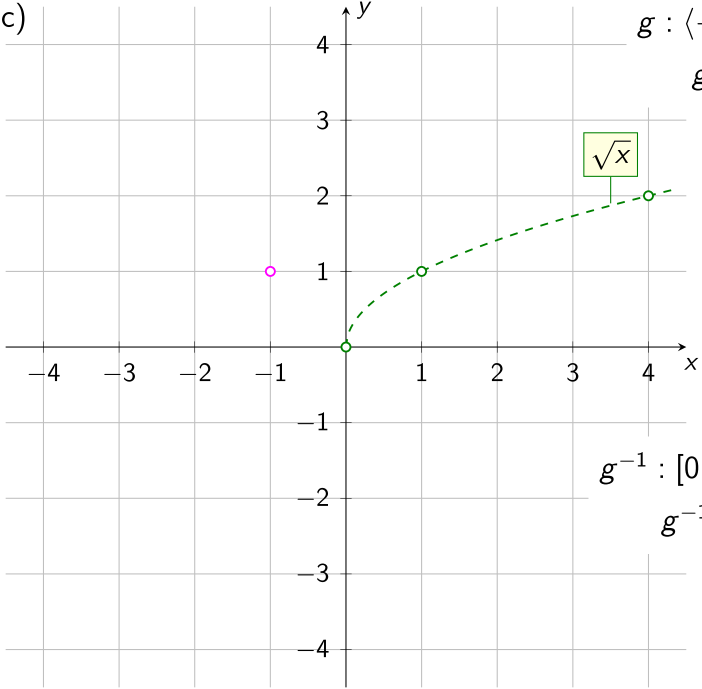

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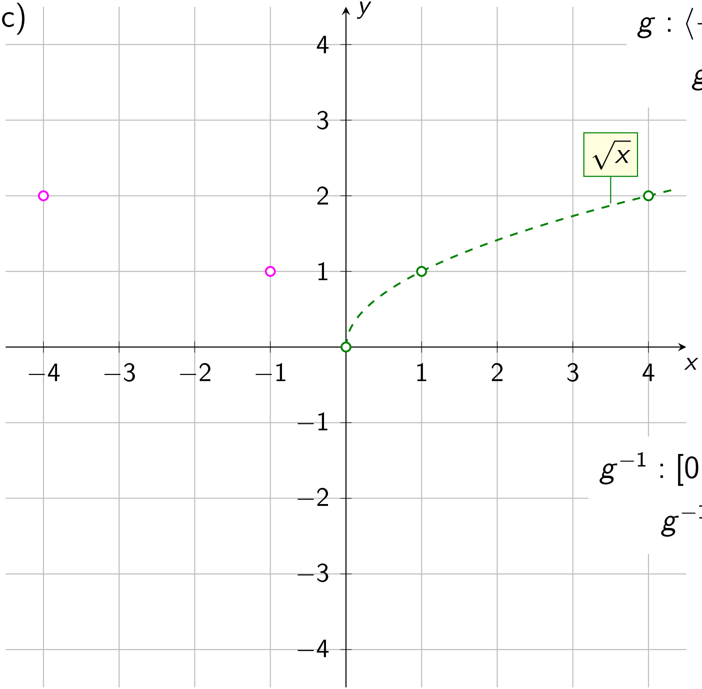

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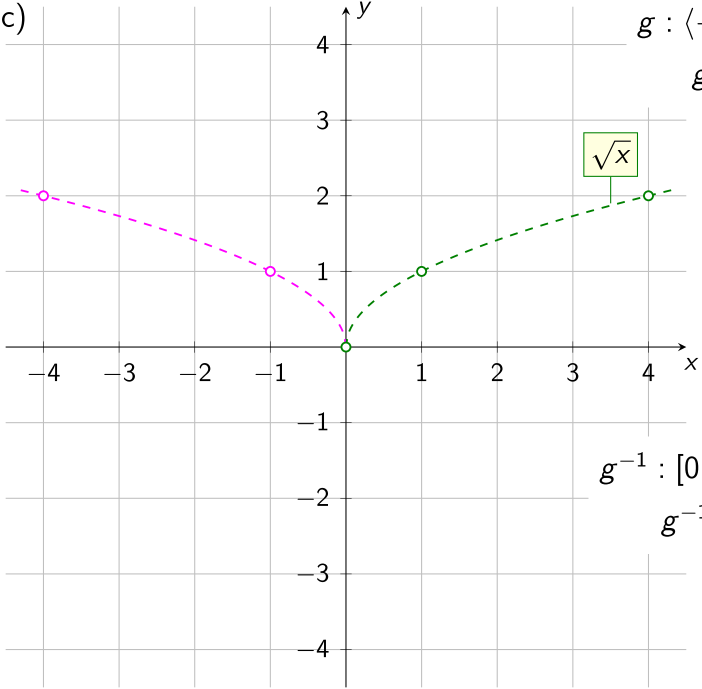

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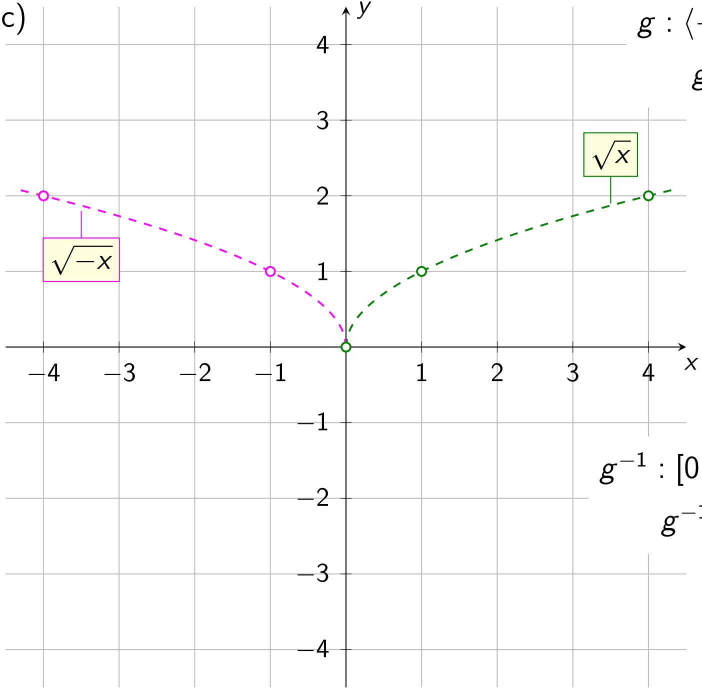

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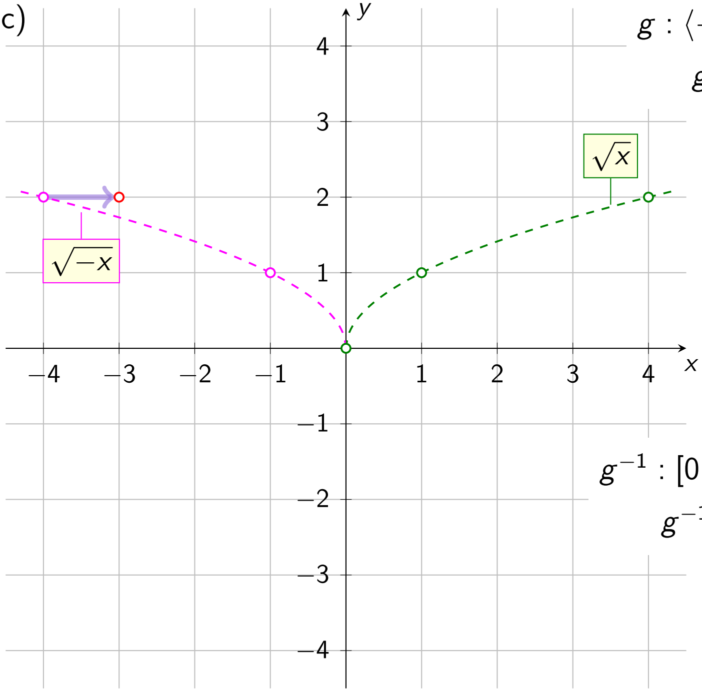

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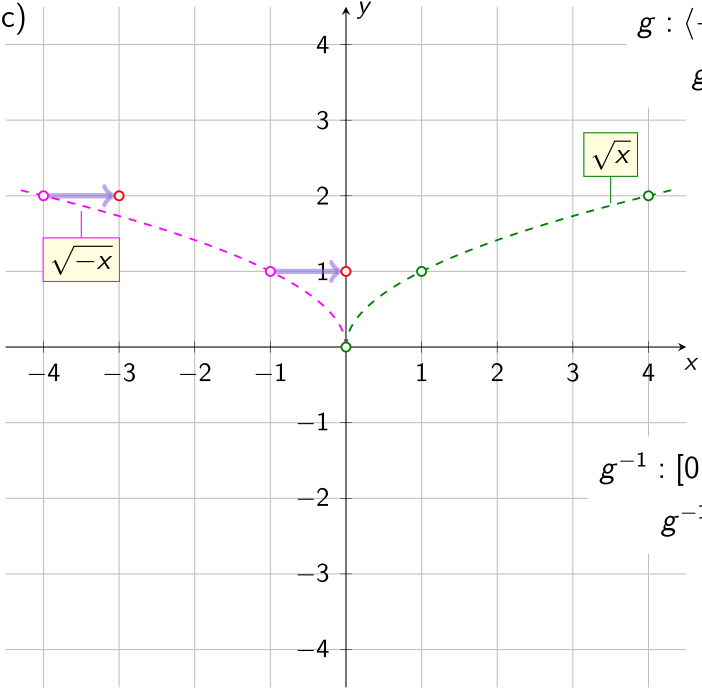

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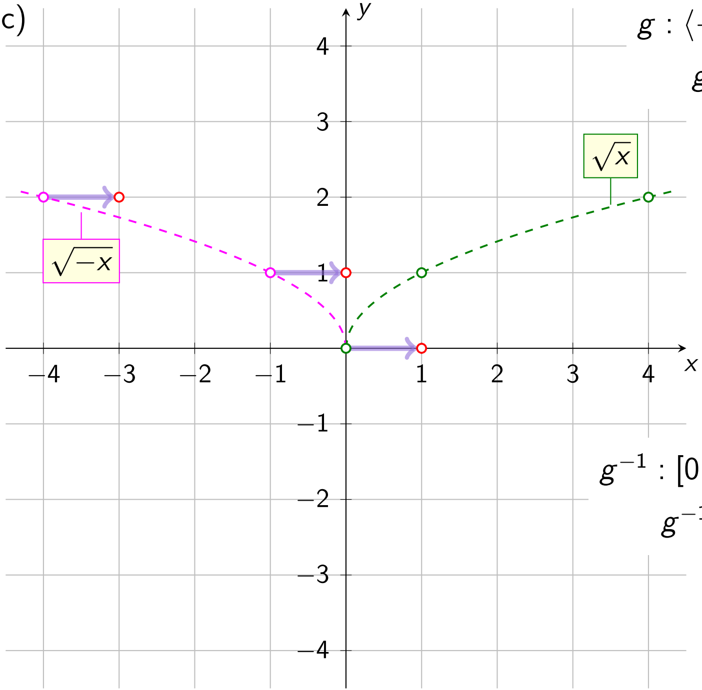

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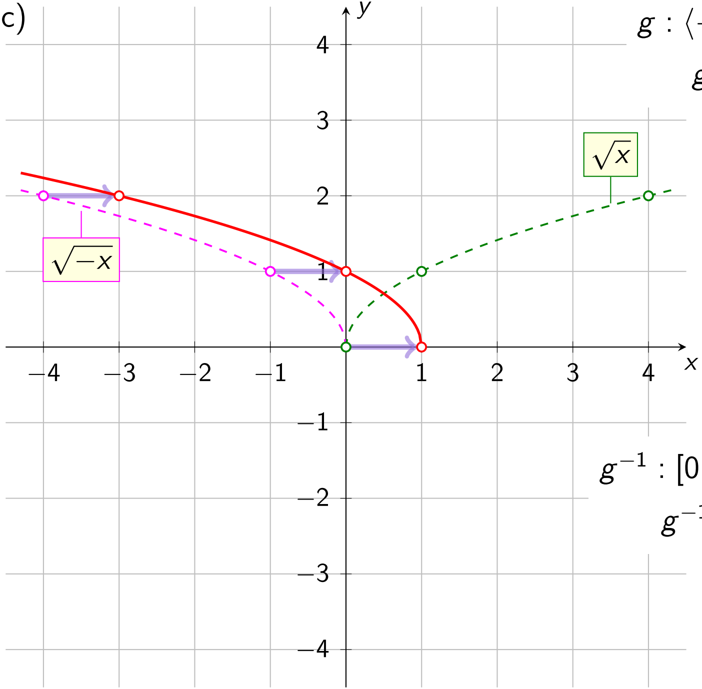

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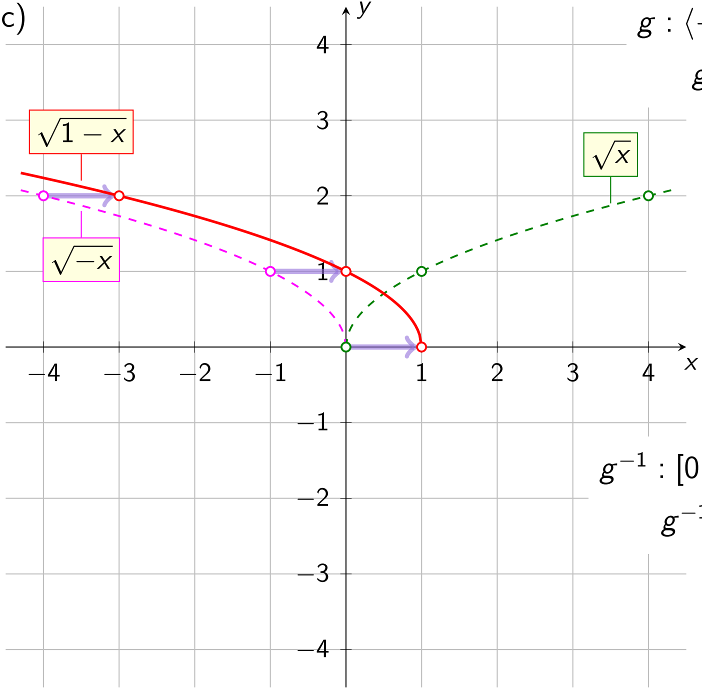

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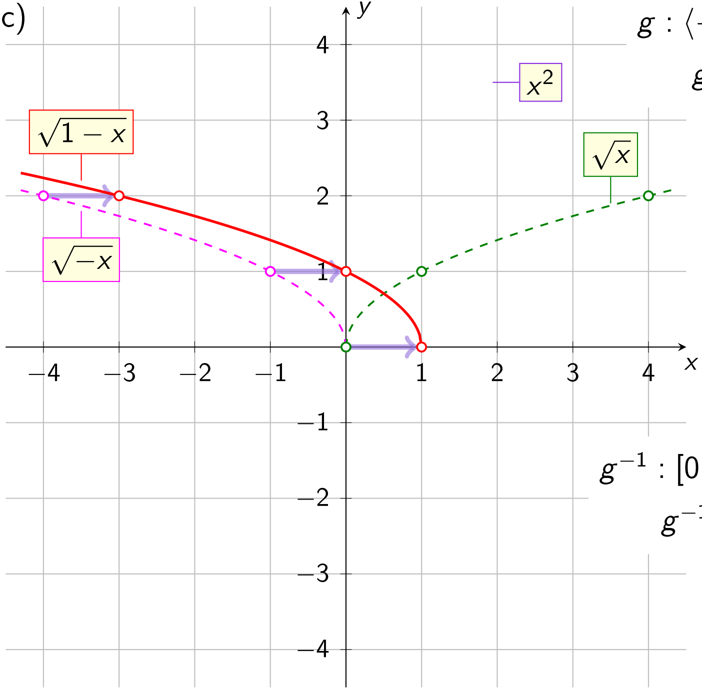

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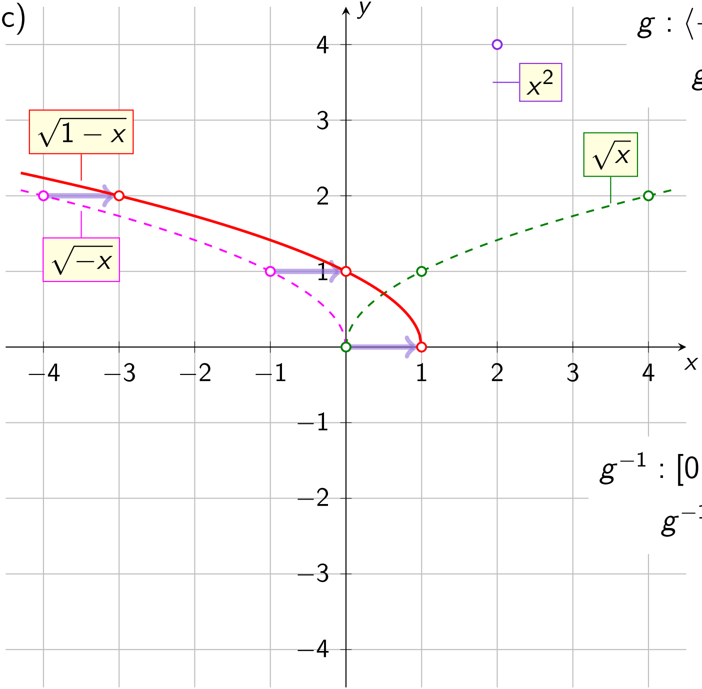

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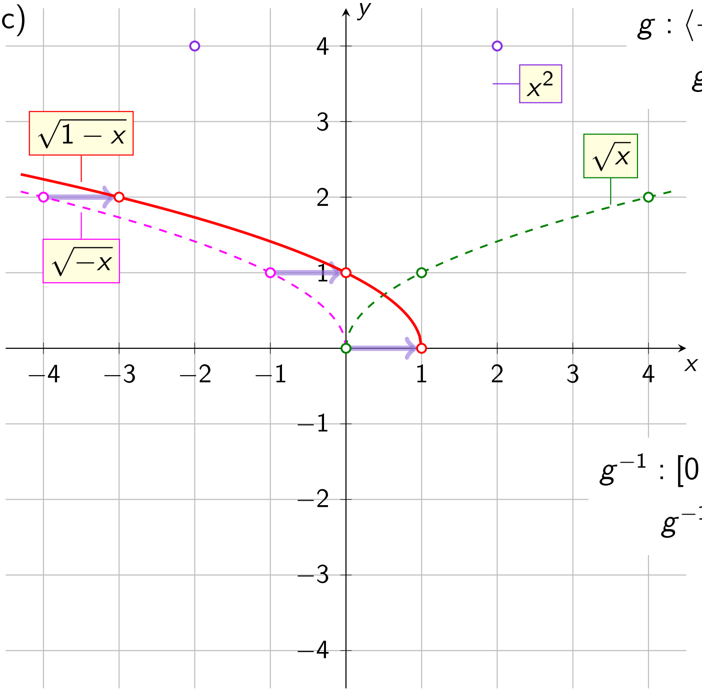

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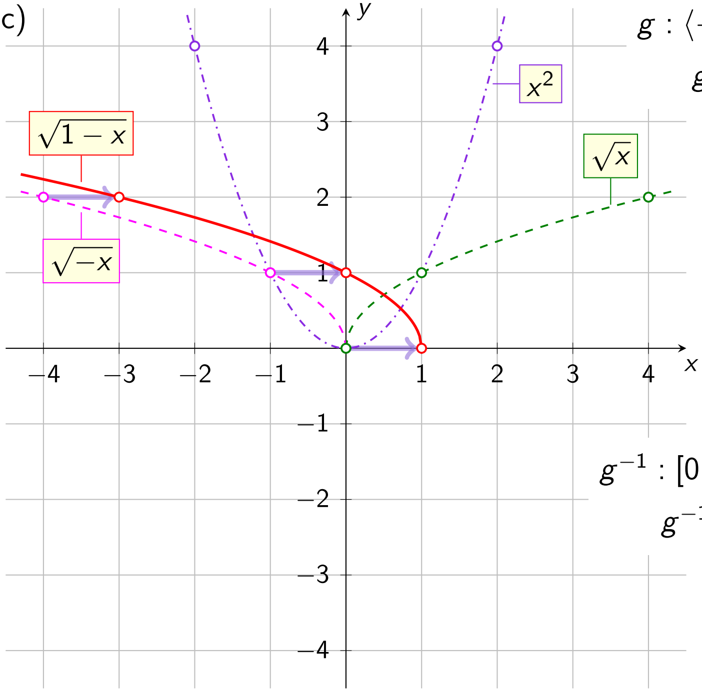

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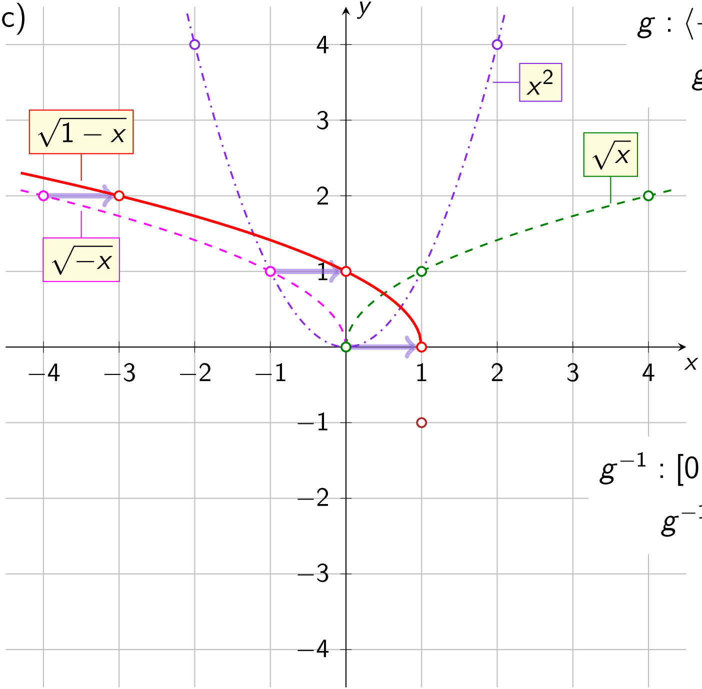

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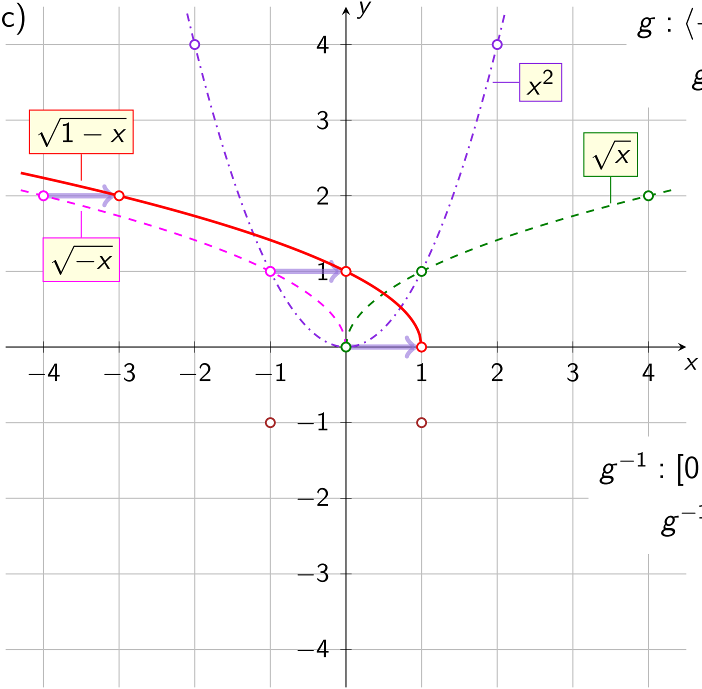

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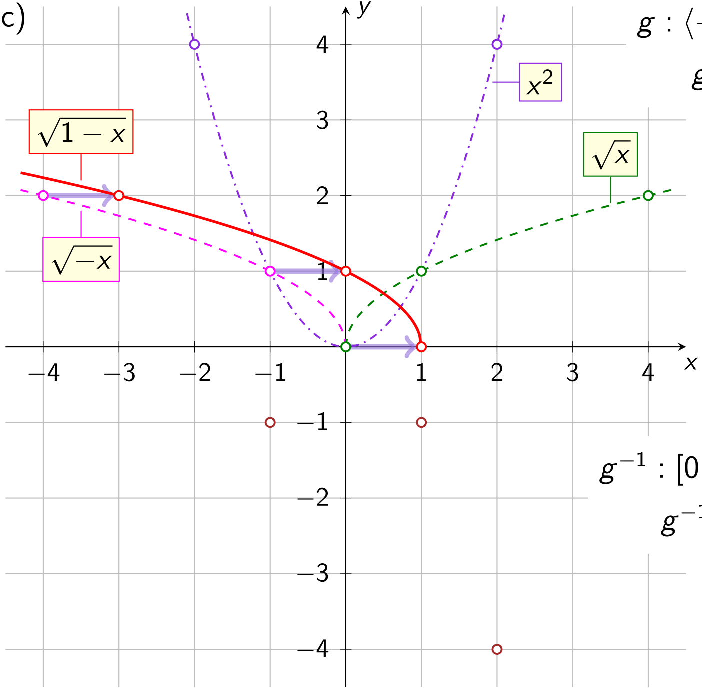

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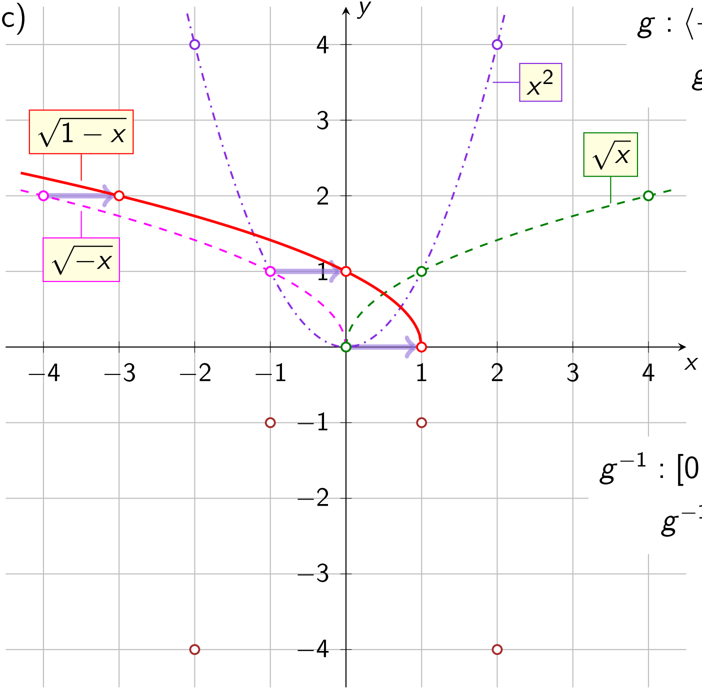

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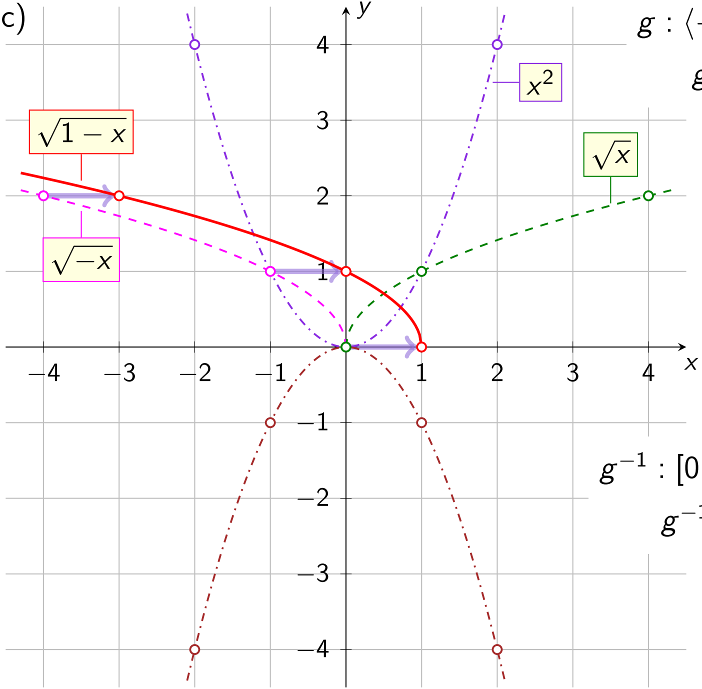

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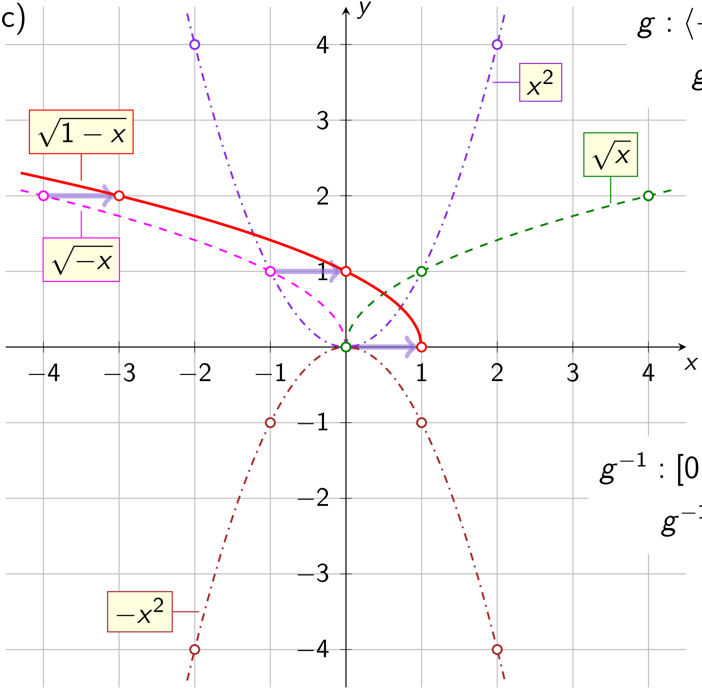

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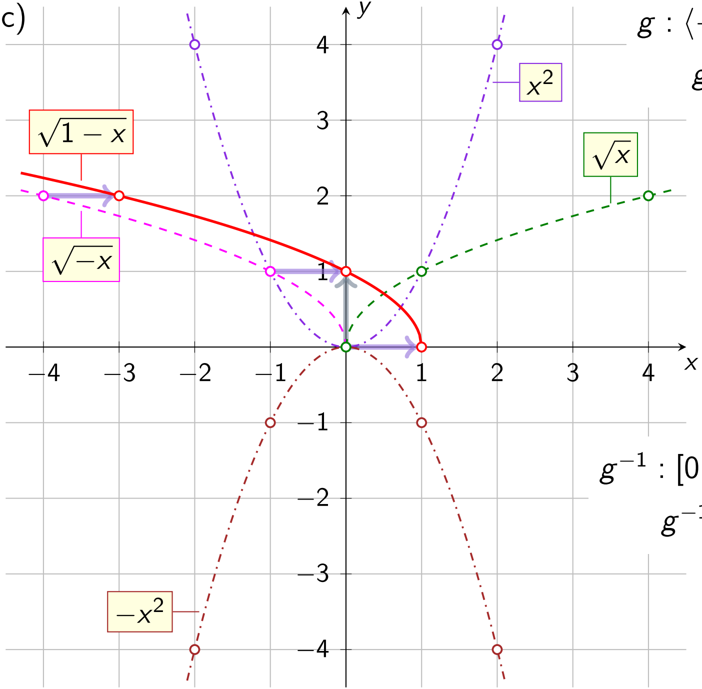

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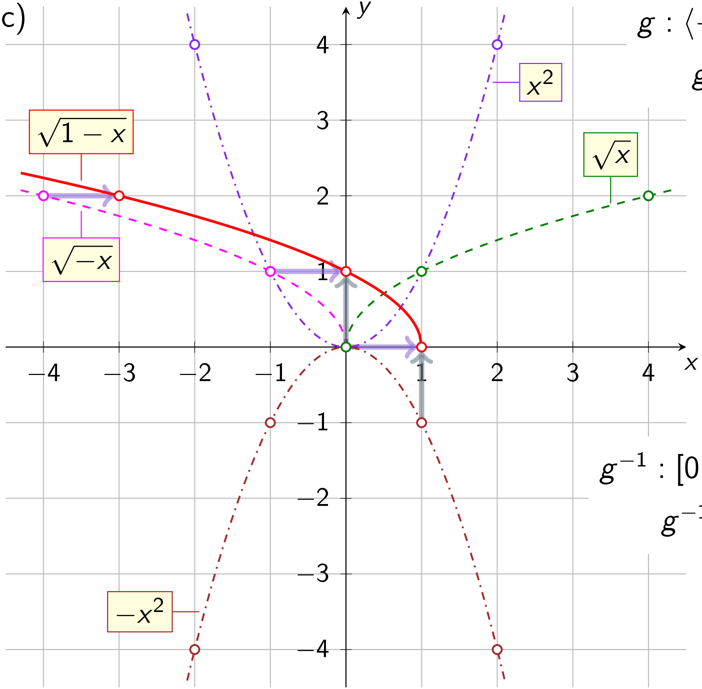

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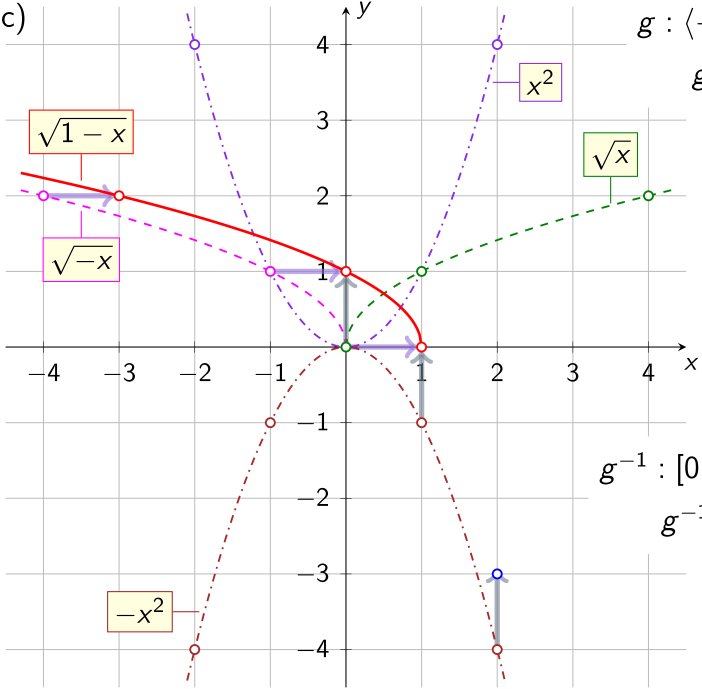

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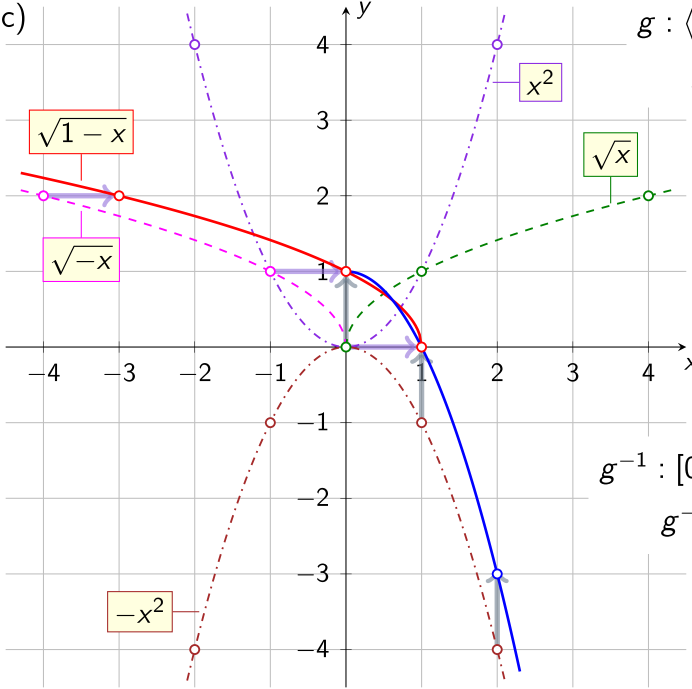

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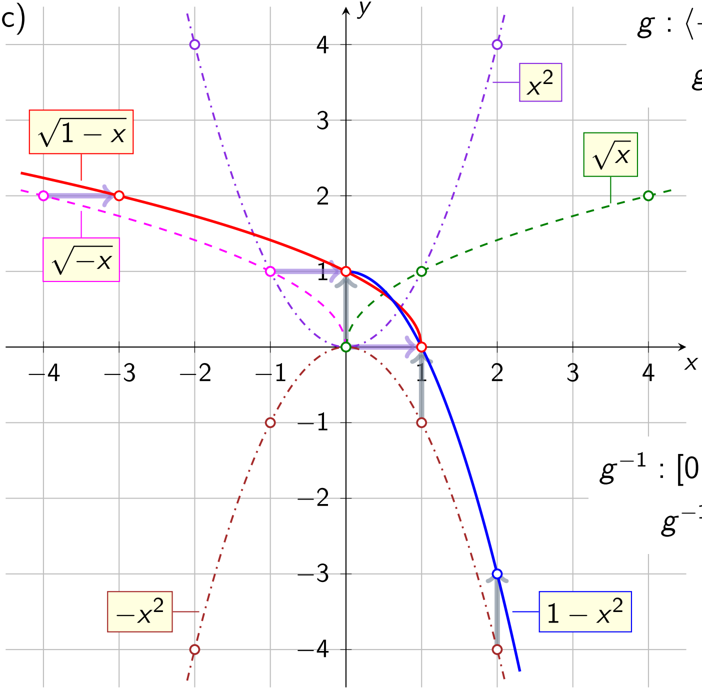

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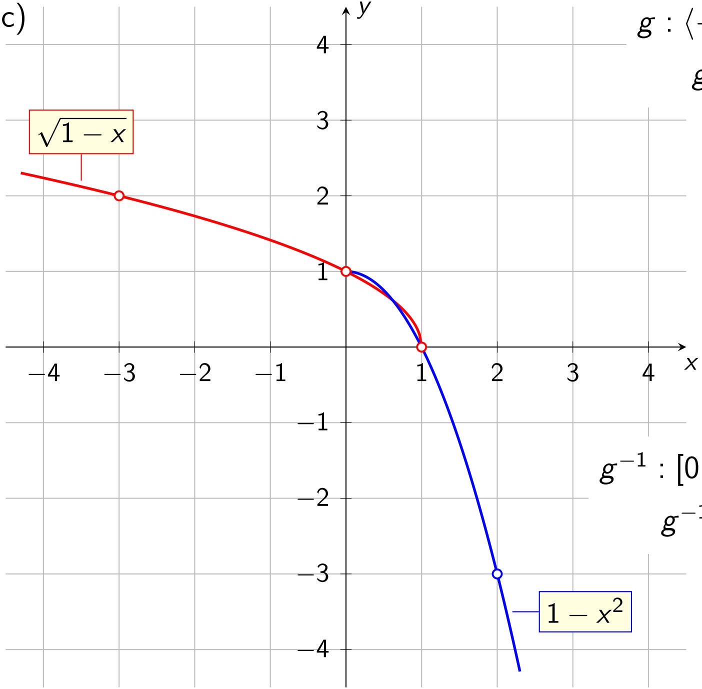

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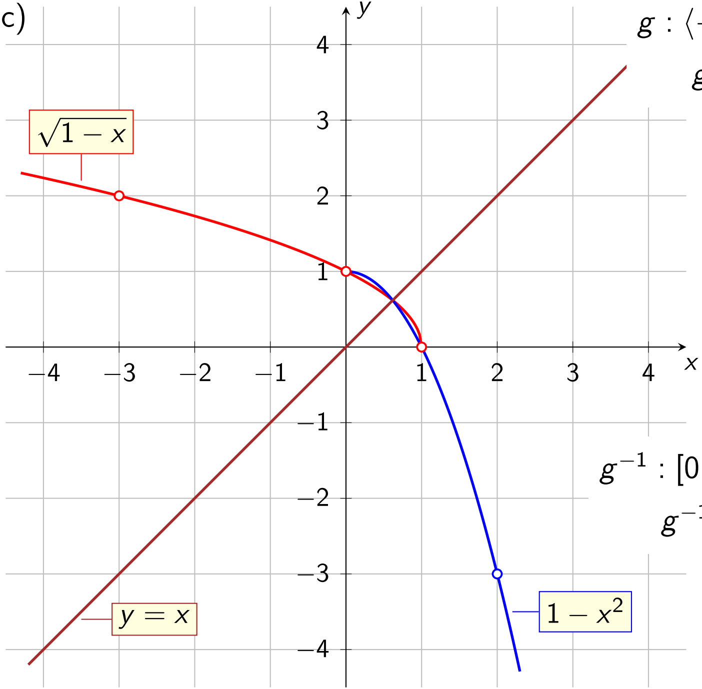

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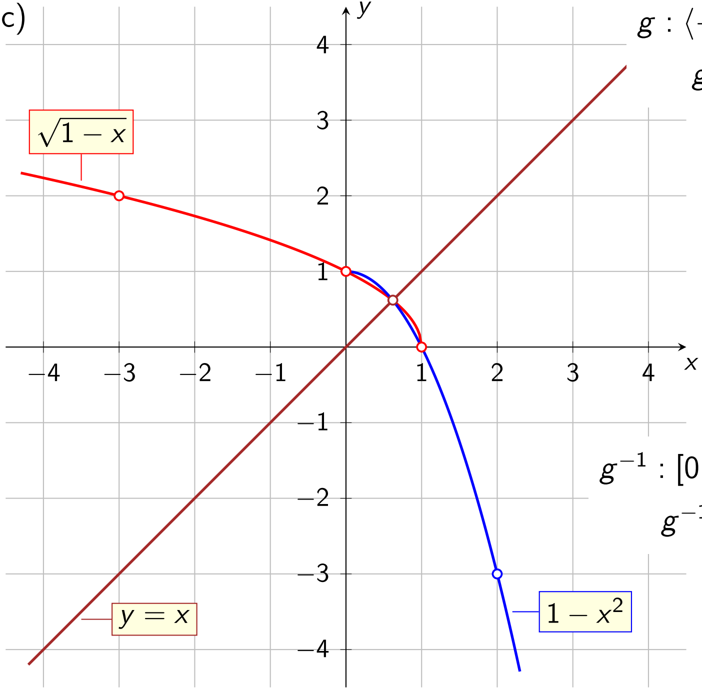

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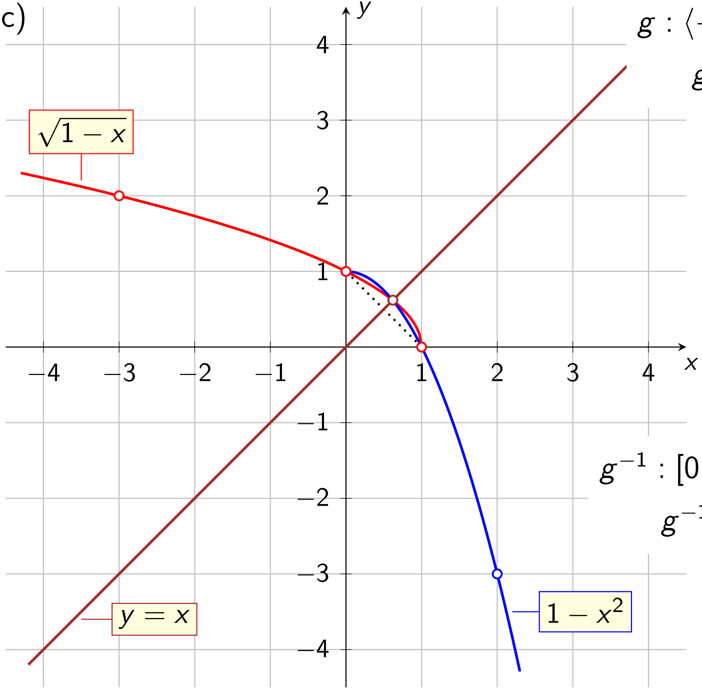

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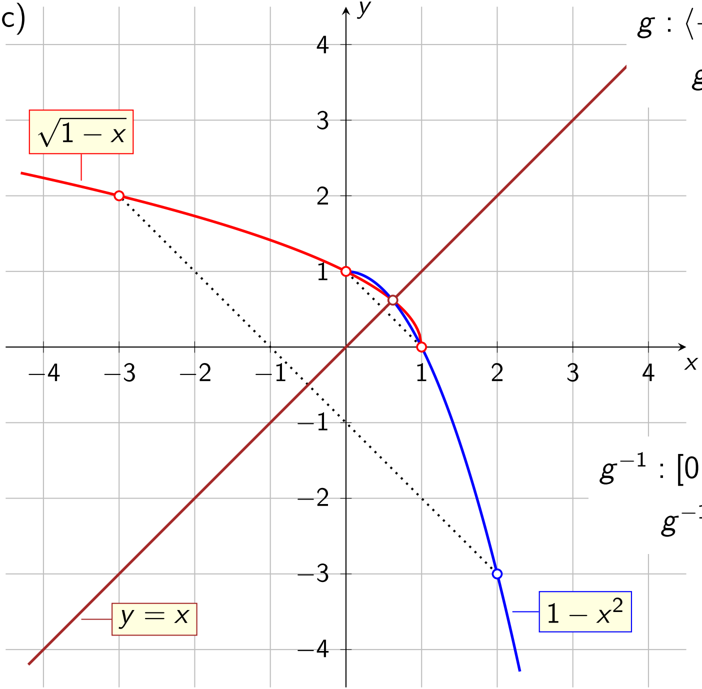

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$$g^{-1}(x) = 1 - x^2$$

četvrti zadatak

Zadatak 4

Na nekom natjecanju je podijeljeno ukupno 15 *nagrada. Uz prvu nagradu dodjeljuje se i novčani iznos od* 5000 *kn, a uz svaku sljedeću novčani iznos za* 250 *kn manji nego uz prethodnu nagradu.*

a) *Koliki se novčani iznos dodjeljuje uz petnaestu nagradu?*
b) *Koliki je ukupni novčani fond za nagrade?*
c) *Koliko je ukupno novaca podijeljeno od devete do četrnaeste nagrade?*

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Rješenje

- Neka je a_n iznos u kunama koji se dodjeljuje za n-tu nagradu.

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a) *Koliki se novčani iznos dodjeljuje uz petnaestu nagradu?*
b) *Koliki je ukupni novčani fond za nagrade?*
c) *Koliko je ukupno novaca podijeljeno od devete do četrnaeste nagrade?*

Rješenje

- Neka je a_n iznos u kunama koji se dodjeljuje za n-tu nagradu.
- Tada je (a_n) aritmetički niz u kojemu je $a_1 = 5000$ i $d = -250$.

$$\boxed{a_n = a_1 + (n-1)d}$$

a)

$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

$$\boxed{a_n = a_1 + (n-1)d}$$

a)

$$a_{15} = a_1 + 14d$$

$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

$$\boxed{a_n = a_1 + (n-1)d}$$

a)

$$a_{15} = a_1 + 14d = 5000 + 14 \cdot (-250)$$

$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

$$\boxed{a_n = a_1 + (n-1)d}$$

a)

$$a_{15} = a_1 + 14d = 5000 + 14 \cdot (-250) = 1500$$

$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

$$\boxed{a_n = a_1 + (n-1)d}$$

a) Za petnaestu nagradu dodjeljuje se 1500 kn.

$$a_{15} = a_1 + 14d = 5000 + 14 \cdot (-250) = 1500$$

$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

$$\boxed{a_n = a_1 + (n-1)d}$$

a) Za petnaestu nagradu dodjeljuje se 1500 kn.

$$a_{15} = a_1 + 14d = 5000 + 14 \cdot (-250) = 1500$$

b) $\boxed{S_n = \frac{n}{2}\left(a_1 + a_n\right)}$

$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

$$\boxed{a_n = a_1 + (n-1)d}$$

a) Za petnaestu nagradu dodjeljuje se 1500 kn.

$$a_{15} = a_1 + 14d = 5000 + 14 \cdot (-250) = 1500$$

b) $\boxed{S_n = \frac{n}{2}\left(a_1 + a_n\right)}$

$\boxed{a_1 = 5000}$

$\boxed{d = -250}$

$$S_{15} = \frac{15}{2}\left(a_1 + a_{15}\right)$$

$$\boxed{a_n = a_1 + (n-1)d}$$

a) Za petnaestu nagradu dodjeljuje se 1500 kn.

$$a_{15} = a_1 + 14d = 5000 + 14 \cdot (-250) = 1500$$

b) $\boxed{S_n = \frac{n}{2}\left(a_1 + a_n\right)}$

$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

$$S_{15} = \frac{15}{2}\left(a_1 + a_{15}\right)$$

$$S_{15} = \frac{15}{2}\left(5000 + 1500\right)$$

$$\boxed{a_n = a_1 + (n-1)d}$$

a) Za petnaestu nagradu dodjeljuje se 1500 kn.

$$a_{15} = a_1 + 14d = 5000 + 14 \cdot (-250) = 1500$$

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$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

$$S_{15} = \frac{15}{2}\left(a_1 + a_{15}\right)$$

$$S_{15} = \frac{15}{2}\left(5000 + 1500\right)$$

$$S_{15} = \frac{15}{2} \cdot 6500$$

$$\boxed{a_n = a_1 + (n-1)d}$$

a) Za petnaestu nagradu dodjeljuje se 1500 kn.

$$a_{15} = a_1 + 14d = 5000 + 14 \cdot (-250) = 1500$$

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$$S_{15} = \frac{15}{2} \cdot 6500$$

$$S_{15} = 48\,750$$

$$\boxed{a_n = a_1 + (n-1)d}$$

a) Za petnaestu nagradu dodjeljuje se 1500 kn.

$$a_{15} = a_1 + 14d = 5000 + 14 \cdot (-250) = 1500$$

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$$S_{15} = \frac{15}{2}\left(a_1 + a_{15}\right)$$

$$S_{15} = \frac{15}{2}\left(5000 + 1500\right)$$

$$S_{15} = \frac{15}{2} \cdot 6500$$

$$S_{15} = 48\,750$$

Ukupni novčani fond za nagrade iznosi 48 750 kn.

$$a_1 = 5000$$

$$d = -250$$

c) $$\boxed{S_n = \frac{n}{2}\big(2a_1 + (n-1)d\big)}$$

$\boxed{a_1 = 5000}$

$\boxed{d = -250}$

c) $\boxed{S_n = \frac{n}{2}\big(2a_1 + (n-1)d\big)}$

$$S_{14} = \frac{14}{2}\big(2 \cdot 5000 + 13 \cdot (-250)\big)$$

$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

c) $\boxed{S_n = \frac{n}{2}\big(2a_1 + (n-1)d\big)}$

$$S_{14} = \frac{14}{2}\big(2 \cdot 5000 + 13 \cdot (-250)\big)$$

$$S_{14} = \frac{14}{2} \cdot 6750$$

$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

c) $$\boxed{S_n = \frac{n}{2}\big(2a_1 + (n-1)d\big)}$$

$$S_{14} = \frac{14}{2}\big(2 \cdot 5000 + 13 \cdot (-250)\big)$$

$$S_{14} = \frac{14}{2} \cdot 6750$$

$$S_{14} = 47\,250$$

$\boxed{a_1 = 5000}$

$\boxed{d = -250}$

c) $\boxed{S_n = \frac{n}{2}\big(2a_1 + (n-1)d\big)}$

$$S_{14} = \frac{14}{2}\big(2 \cdot 5000 + 13 \cdot (-250)\big) \qquad S_8 = \frac{8}{2}\big(2 \cdot 5000 + 7 \cdot (-250)\big)$$

$$S_{14} = \frac{14}{2} \cdot 6750$$

$$S_{14} = 47\,250$$

$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

c) $\boxed{S_n = \frac{n}{2}\big(2a_1 + (n-1)d\big)}$

$$S_{14} = \frac{14}{2}\big(2 \cdot 5000 + 13 \cdot (-250)\big)$$

$$S_{14} = \frac{14}{2} \cdot 6750$$

$$S_{14} = 47\,250$$

$$S_8 = \frac{8}{2}\big(2 \cdot 5000 + 7 \cdot (-250)\big)$$

$$S_8 = \frac{8}{2} \cdot 8250$$

$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

c) $\boxed{S_n = \frac{n}{2}\big(2a_1 + (n-1)d\big)}$

$$S_{14} = \frac{14}{2}\big(2 \cdot 5000 + 13 \cdot (-250)\big)$$

$$S_{14} = \frac{14}{2} \cdot 6750$$

$$S_{14} = 47\,250$$

$$S_8 = \frac{8}{2}\big(2 \cdot 5000 + 7 \cdot (-250)\big)$$

$$S_8 = \frac{8}{2} \cdot 8250$$

$$S_8 = 33\,000$$

$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

c) $$\boxed{S_n = \frac{n}{2}\big(2a_1 + (n-1)d\big)}$$

$$S_{14} = \frac{14}{2}\big(2 \cdot 5000 + 13 \cdot (-250)\big)$$

$$S_{14} = \frac{14}{2} \cdot 6750$$

$$S_{14} = 47\,250$$

$$S_8 = \frac{8}{2}\big(2 \cdot 5000 + 7 \cdot (-250)\big)$$

$$S_8 = \frac{8}{2} \cdot 8250$$

$$S_8 = 33\,000$$

$$S_{14} - S_8 =$$

$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

c) $$\boxed{S_n = \frac{n}{2}\big(2a_1 + (n-1)d\big)}$$

$$S_{14} = \frac{14}{2}\big(2 \cdot 5000 + 13 \cdot (-250)\big)$$

$$S_{14} = \frac{14}{2} \cdot 6750$$

$$S_{14} = 47\,250$$

$$S_8 = \frac{8}{2}\big(2 \cdot 5000 + 7 \cdot (-250)\big)$$

$$S_8 = \frac{8}{2} \cdot 8250$$

$$S_8 = 33\,000$$

$$S_{14} - S_8 = 47\,250 - 33\,000$$

$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

c) $\boxed{S_n = \frac{n}{2}\big(2a_1 + (n-1)d\big)}$

$$S_{14} = \frac{14}{2}\big(2 \cdot 5000 + 13 \cdot (-250)\big) \qquad S_8 = \frac{8}{2}\big(2 \cdot 5000 + 7 \cdot (-250)\big)$$

$$S_{14} = \frac{14}{2} \cdot 6750 \qquad S_8 = \frac{8}{2} \cdot 8250$$

$$S_{14} = 47\,250 \qquad S_8 = 33\,000$$

$$S_{14} - S_8 = 47\,250 - 33\,000 = 14\,250$$

$$\boxed{a_1 = 5000}$$

$$\boxed{d = -250}$$

c) $\boxed{S_n = \frac{n}{2}\big(2a_1 + (n-1)d\big)}$

$$S_{14} = \frac{14}{2}\big(2 \cdot 5000 + 13 \cdot (-250)\big) \qquad S_8 = \frac{8}{2}\big(2 \cdot 5000 + 7 \cdot (-250)\big)$$

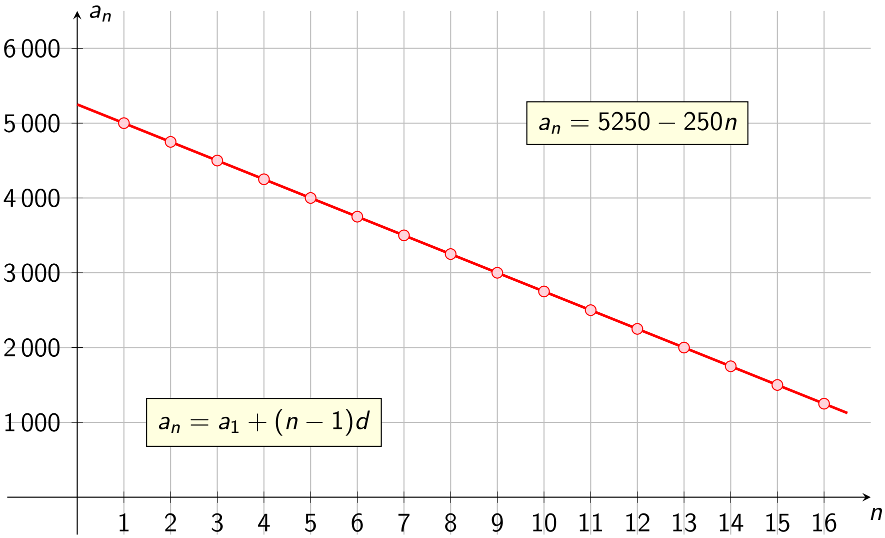
$$S_{14} = \frac{14}{2} \cdot 6750 \qquad S_8 = \frac{8}{2} \cdot 8250$$

$$S_{14} = 47\,250 \qquad S_8 = 33\,000$$

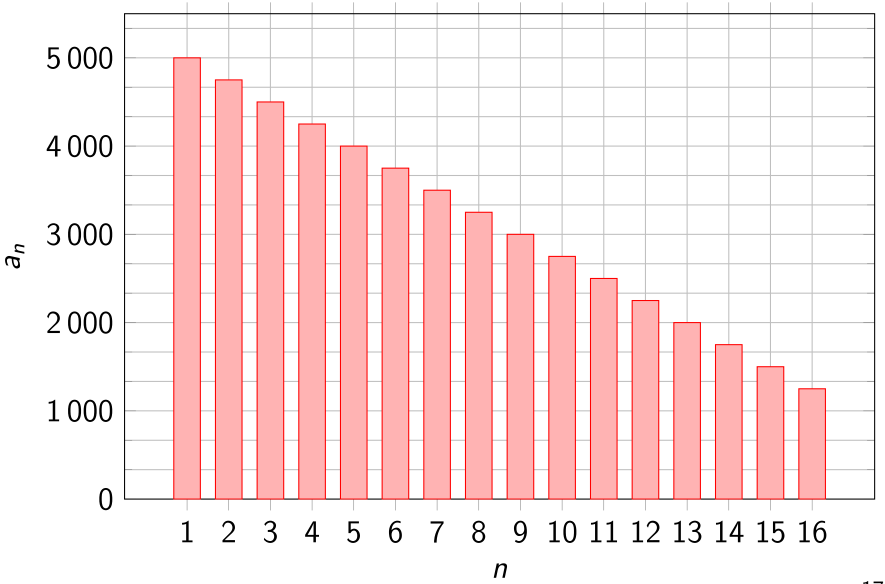
$$S_{14} - S_8 = 47\,250 - 33\,000 = 14\,250$$

Od devete do četrnaeste nagrade podijeljeno je ukupno 14 250 kn.

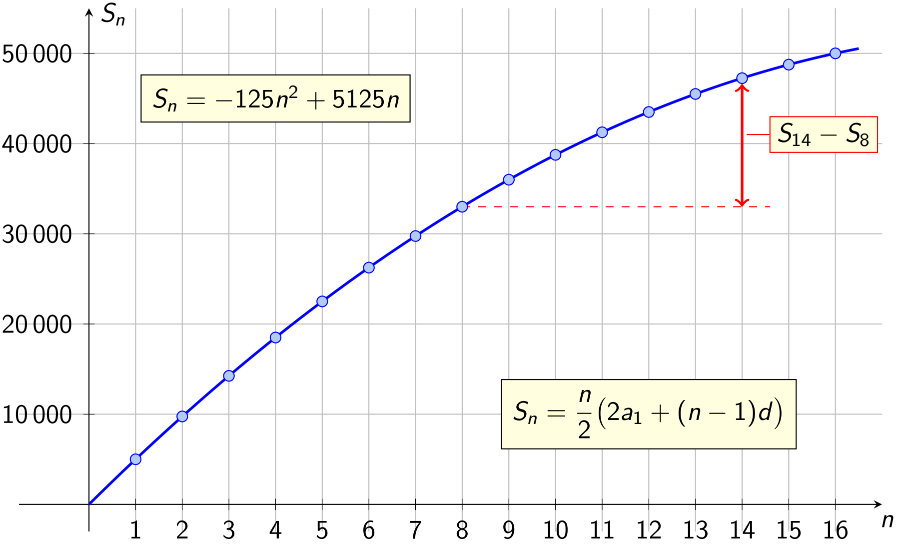
Niz (a_n) – dijagram točkama



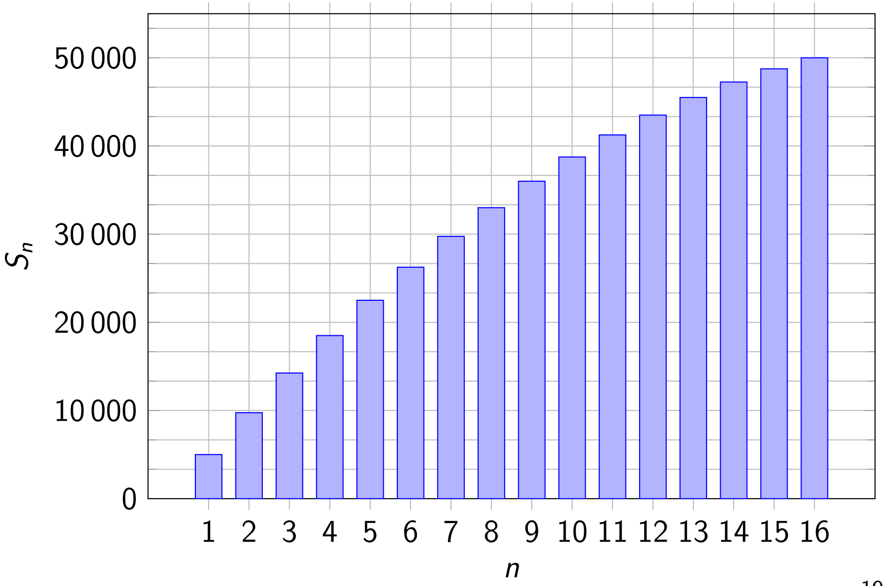
Niz (a_n) – uspravni stupci



Niz (S_n) – dijagram točkama



Niz (S_n) – uspravni stupci



peti zadatak

Zadatak 5

Petar zarađuje godišnje 40 000 *kn. Ako mu se svake godine godišnja zarada poveća za* 2% *u odnosu na prethodnu godinu, koliko će Petar ukupno zaraditi nakon* 10 *godina? Koliko će Petar zaraditi u desetoj godini?*

Zadatak 5

Petar zarađuje godišnje 40 000 *kn. Ako mu se svake godine godišnja zarada poveća za* 2% *u odnosu na prethodnu godinu, koliko će Petar ukupno zaraditi nakon* 10 *godina? Koliko će Petar zaraditi u desetoj godini?*

Rješenje

- Neka je a_n Petrova zarada u n-toj godini.

Zadatak 5

Petar zarađuje godišnje $40\,000\,kn$. *Ako mu se svake godine godišnja zarada poveća za* 2% *u odnosu na prethodnu godinu, koliko će Petar ukupno zaraditi nakon* 10 *godina? Koliko će Petar zaraditi u desetoj godini?*

Rješenje

- Neka je a_n Petrova zarada u n-toj godini.
- Iz uvjeta zadatka imamo

$$a_n =$$

Zadatak 5

Petar zarađuje godišnje 40 000 kn. Ako mu se svake godine godišnja zarada poveća za 2% u odnosu na prethodnu godinu, koliko će Petar ukupno zaraditi nakon 10 godina? Koliko će Petar zaraditi u desetoj godini?

Rješenje

- Neka je a_n Petrova zarada u n-toj godini.
- Iz uvjeta zadatka imamo

$$a_n = a_{n-1}$$

Zadatak 5

Petar zarađuje godišnje 40 000 *kn. Ako mu se svake godine godišnja zarada poveća za* 2% *u odnosu na prethodnu godinu, koliko će Petar ukupno zaraditi nakon* 10 *godina? Koliko će Petar zaraditi u desetoj godini?*

Rješenje

- Neka je a_n Petrova zarada u n-toj godini.
- Iz uvjeta zadatka imamo

$$a_n = a_{n-1} +$$

Zadatak 5

Petar zarađuje godišnje $40\,000$ *kn. Ako mu se svake godine godišnja zarada poveća za* 2% *u odnosu na prethodnu godinu, koliko će Petar ukupno zaraditi nakon* 10 *godina? Koliko će Petar zaraditi u desetoj godini?*

Rješenje

- Neka je a_n Petrova zarada u n-toj godini.
- Iz uvjeta zadatka imamo

$$a_n = a_{n-1} + \frac{2}{100} a_{n-1}$$

Zadatak 5

Petar zarađuje godišnje 40 000 kn. Ako mu se svake godine godišnja zarada poveća za 2% u odnosu na prethodnu godinu, koliko će Petar ukupno zaraditi nakon 10 godina? Koliko će Petar zaraditi u desetoj godini?

Rješenje

- Neka je a_n Petrova zarada u n-toj godini.
- Iz uvjeta zadatka imamo

$$a_n = a_{n-1} + \frac{2}{100} a_{n-1} = 1.02 a_{n-1}$$

Zadatak 5

Petar zarađuje godišnje 40 000 *kn. Ako mu se svake godine godišnja zarada poveća za* 2% *u odnosu na prethodnu godinu, koliko će Petar ukupno zaraditi nakon* 10 *godina? Koliko će Petar zaraditi u desetoj godini?*

Rješenje

- Neka je a_n Petrova zarada u n-toj godini.
- Iz uvjeta zadatka imamo

$$a_n = a_{n-1} + \frac{2}{100} a_{n-1} = 1.02 a_{n-1}$$

pa je $\dfrac{a_n}{a_{n-1}} = 1.02$.

Zadatak 5

Petar zarađuje godišnje 40 000 kn. Ako mu se svake godine godišnja zarada poveća za 2% u odnosu na prethodnu godinu, koliko će Petar ukupno zaraditi nakon 10 godina? Koliko će Petar zaraditi u desetoj godini?

Rješenje

- Neka je a_n Petrova zarada u n-toj godini.
- Iz uvjeta zadatka imamo

$$a_n = a_{n-1} + \frac{2}{100}a_{n-1} = 1.02a_{n-1}$$

  pa je $\dfrac{a_n}{a_{n-1}} = 1.02.$

- Stoga je (a_n) geometrijski niz u kojemu je $a_1 = 40\,000$ i $q = 1.02.$

$$S_n = a_1 \cdot \frac{q^n - 1}{q - 1}$$

$$\boxed{n = 10}$$

$$\boxed{a_1 = 40\,000}$$

$$\boxed{q = 1.02}$$

$$S_n = a_1 \cdot \frac{q^n - 1}{q - 1}$$

$$S_{10} = 40\,000 \cdot \frac{1.02^{10} - 1}{1.02 - 1}$$

$$\boxed{n = 10}$$

$$\boxed{a_1 = 40\,000}$$

$$\boxed{q = 1.02}$$

$$S_n = a_1 \cdot \frac{q^n - 1}{q - 1}$$

$$S_{10} = 40\,000 \cdot \frac{1.02^{10} - 1}{1.02 - 1}$$

$$S_{10} = 437\,988.84$$

$$\boxed{n = 10}$$

$$\boxed{a_1 = 40\,000}$$

$$\boxed{q = 1.02}$$

$$S_n = a_1 \cdot \frac{q^n - 1}{q - 1}$$

$$S_{10} = 40\,000 \cdot \frac{1.02^{10} - 1}{1.02 - 1}$$

$$S_{10} = 437\,988.84$$

Nakon 10 godina Petar će zaraditi ukupno 437 988.84 kn.

$$\boxed{n = 10}$$

$$\boxed{a_1 = 40\,000}$$

$$\boxed{q = 1.02}$$

$$S_n = a_1 \cdot \frac{q^n - 1}{q - 1}$$

$$S_{10} = 40\,000 \cdot \frac{1.02^{10} - 1}{1.02 - 1}$$

$$S_{10} = 437\,988.84$$

Nakon 10 godina Petar će zaraditi ukupno 437 988.84 kn.

$$a_n = a_1 \cdot q^{n-1}$$

$\boxed{n = 10}$

$\boxed{a_1 = 40\,000}$

$\boxed{q = 1.02}$

$$S_n = a_1 \cdot \frac{q^n - 1}{q - 1}$$

$$S_{10} = 40\,000 \cdot \frac{1.02^{10} - 1}{1.02 - 1}$$

$$S_{10} = 437\,988.84$$

Nakon 10 godina Petar će zaraditi ukupno 437 988.84 kn.

$$a_n = a_1 \cdot q^{n-1}$$

$$a_{10} = 40\,000 \cdot 1.02^9$$

$$\boxed{n = 10}$$
$$\boxed{a_1 = 40\,000}$$
$$\boxed{q = 1.02}$$

$$S_n = a_1 \cdot \frac{q^n - 1}{q - 1}$$

$$S_{10} = 40\,000 \cdot \frac{1.02^{10} - 1}{1.02 - 1}$$

$$S_{10} = 437\,988.84$$

Nakon 10 godina Petar će zaraditi ukupno 437 988.84 kn.

$$a_n = a_1 \cdot q^{n-1}$$

$$a_{10} = 40\,000 \cdot 1.02^9$$

$$a_{10} = 47\,803.70$$

$$\boxed{n = 10}$$
$$\boxed{a_1 = 40\,000}$$
$$\boxed{q = 1.02}$$

$$S_n = a_1 \cdot \frac{q^n - 1}{q - 1}$$

$$S_{10} = 40\,000 \cdot \frac{1.02^{10} - 1}{1.02 - 1}$$

$$S_{10} = 437\,988.84$$

Nakon 10 godina Petar će zaraditi ukupno 437 988.84 kn.

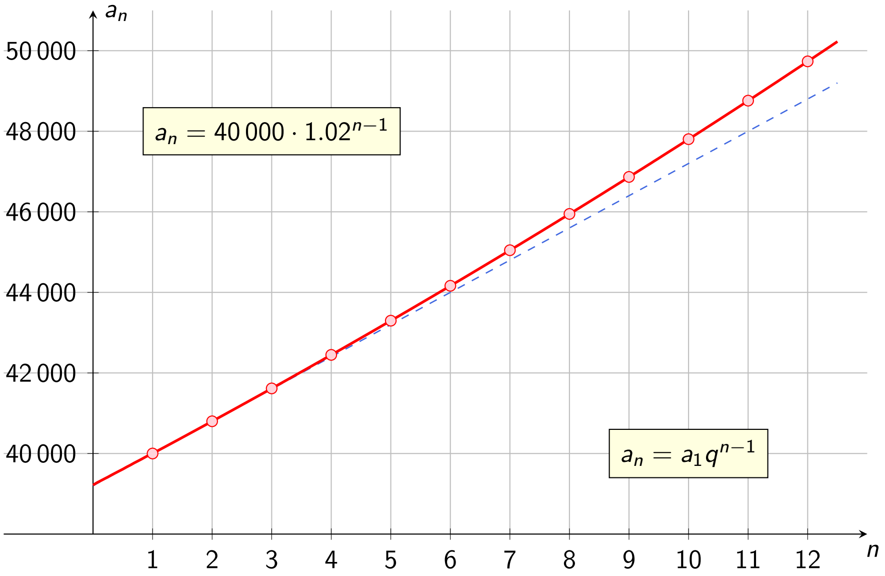
$$a_n = a_1 \cdot q^{n-1}$$

$$a_{10} = 40\,000 \cdot 1.02^9$$

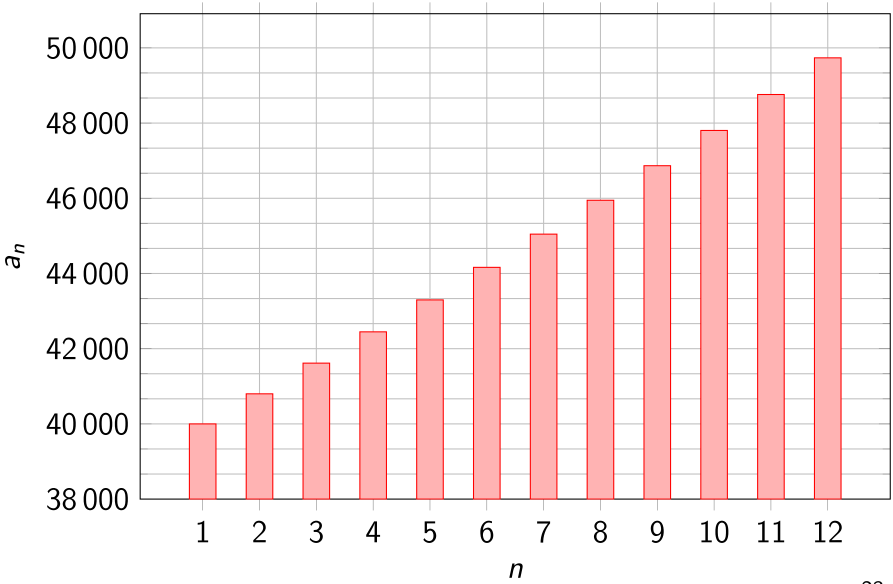
$$a_{10} = 47\,803.70$$

U desetoj godini Petar će zaraditi 47 803.70 kn.

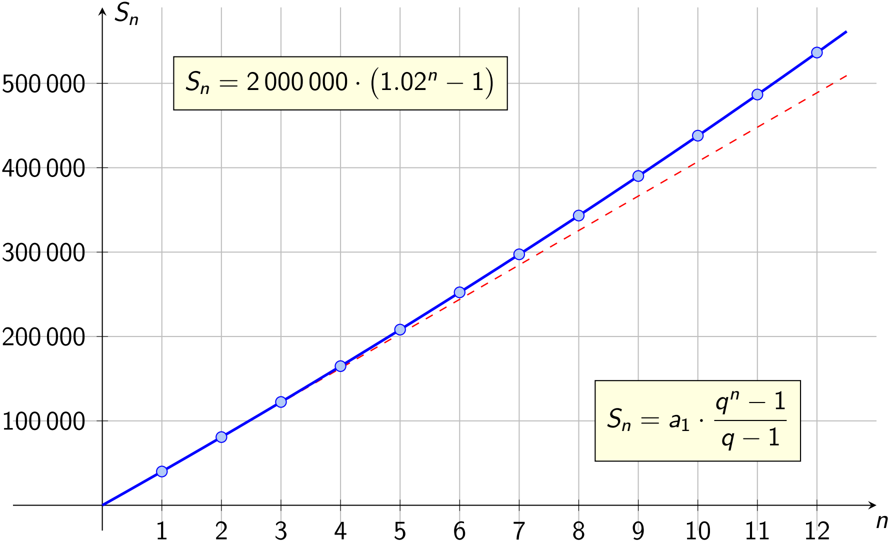
Niz (a_n) – dijagram točkama



Niz (a_n) – uspravni stupci



Niz (S_n) – dijagram točkama



Niz (S_n) – uspravni stupci