

str. 42, př. 1

a)

$$\frac{x^2}{x+1}$$

$$D(x) = \bar{R} - \{-1\}$$

b)

$$\frac{x+2}{x^2-x-6} = \frac{x+2}{(x-3)(x+2)}$$

$$D(x) = \bar{R} - \{-2, 3\}$$

c)

$$\sqrt{2+x-x^2}$$

$$x^2-x-2 \geq 0$$

$$x_{1,2} = -1, 2$$

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

d)

$$\sqrt{3x-x^3}$$

$$-x^3+3x \geq 0$$

$$-x(x^2-3) \geq 0$$

x^2-3	+	$(-\infty, -\sqrt{3})$	-	$(-\sqrt{3}, 0)$	+	$(0, \sqrt{3})$	-	$(\sqrt{3}, \infty)$

$$D(x) \in (-\infty, \sqrt{3}] \cup \langle 0, \sqrt{3} \rangle$$

e)

$$\frac{1}{\sqrt{x^2-3x+2}} = \frac{1}{(x-1)(x-2)}$$

$$D(x) = \bar{R} - \{1, 2\}$$

f)

$$\sqrt{x^2-1} + \sqrt{1-x}$$

$x^2 \geq 1$	$1-x \geq 0$
$ x \geq 1$	$x \leq 1$

$$D(x) = (-\infty, -1] + \{1\}$$

g)

$$\sqrt{\frac{x-2}{x+2}} + \sqrt{\frac{1-x}{1+x}}$$

$\frac{x-2}{x+2} \geq 0$	$\frac{1-x}{1+x} \geq 0$
$x_1 \in (-\infty; -2) \cup (2; \infty)$	$x_2 \in (-1; 1)$

$$x = x_1 \cap x_2 = \emptyset$$

h)

$$\sqrt{1-|x|}$$

$$|x| \leq 1$$

$$D(x) \in \langle -1, 1 \rangle$$

i)
 $\log_2 \log_3 \log_4 x$
 $\log_4 x > 1$
 $x > 4^1$
 $D(x) \in (4; \infty)$

j)

$$\frac{\ln(x+1)}{2^x - 1} \quad \begin{array}{l} 2^x - 1 \neq 0 \\ 2^x \neq 1 \\ x \neq 0 \end{array} \quad \begin{array}{l} x+1 > 0 \\ x > -1 \end{array}$$

$D(x) \in (-1; 0) \cup (0; +\infty)$

k)
 $\ln|\sin x|$
 $\sin x \neq 0$
 $x \neq \{k\pi\}, k \in Z$

l)

$$\arcsin \sqrt{\frac{2x+1}{2}} \quad \begin{array}{l} \frac{2x+1}{2} \geq 0 \\ x \geq -\frac{1}{2} \end{array} \quad \begin{array}{l} \frac{2x+1}{2} \leq 1 \\ x \leq \frac{1}{2} \end{array}$$

$D(x) \in \left\langle -\frac{1}{2}; \frac{1}{2} \right\rangle$

m)

$$\left(\arctan(x-1)\right)^{\frac{1}{x-3}} \quad \begin{array}{l} x \neq 3 \\ \arctan(x-1) \geq 1 \\ x-1 \geq 0 \\ x \geq 1 \end{array}$$

$D(x) \in (1; 3) \cup (3; \infty)$

n)

$$\log\left(1 - \log(x^2 - 4x + 13)\right)$$

$$\log(x^2 - 4x + 13) < 1$$

$$x^2 - 4x + 13 < 10$$

$$x^2 - 4x + 3 < 0$$

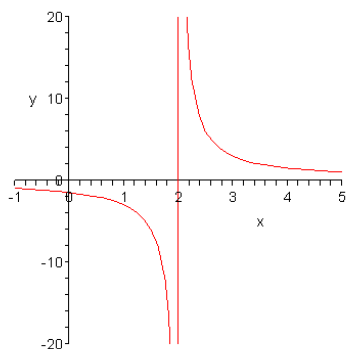
$$(x-3) \cdot (x-1) < 0$$

$D(x) \in (1; 3)$

str. 43, př. 2

a)

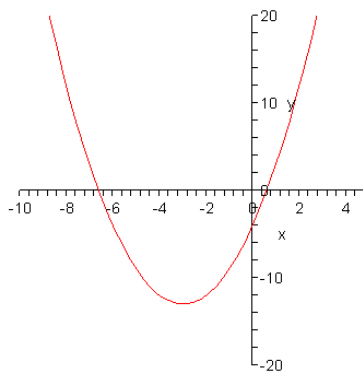
$$\frac{3}{x-2} \quad x \neq 2$$



Není omezená shora ani zdola.

b)

$$x^2 + 6x - 4$$

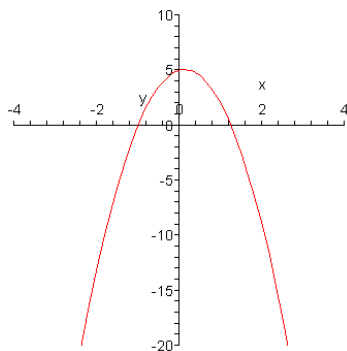


Omezená zdola.

a)

c)

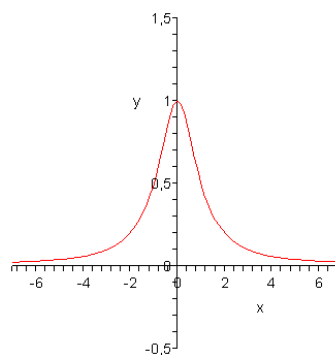
$$-2x^2 + x + 5$$



Omezená shora.

d)

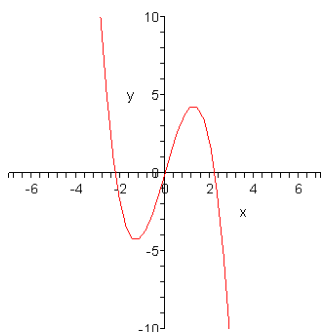
$$\frac{1}{x^2 + 1}$$



Omezená shora.

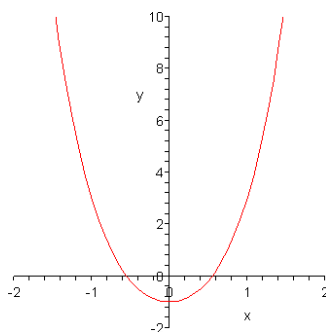
str. 43, př. 4

a)
 $5x - x^3$



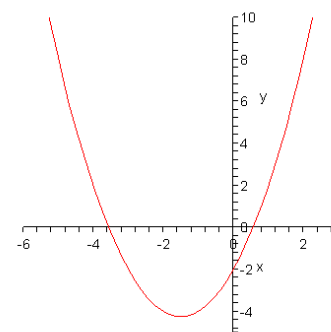
Lichá fce.

b)
 $x^4 + 3x^2 - 1$



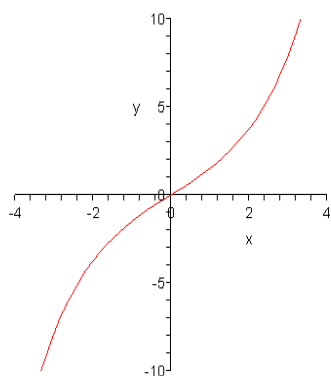
Sudá fce.

c)
 $x^2 + 3x - 2$



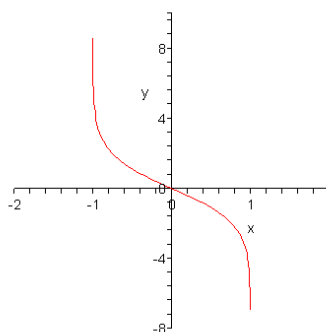
Sudá fce.

d)
 $2^x - 2^{-x}$



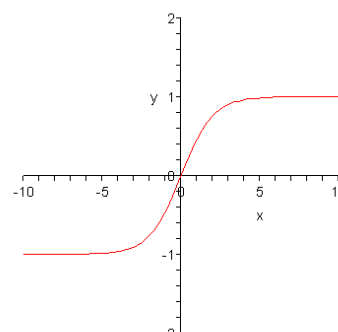
Lichá fce.

e)
 $\ln \frac{1-x}{1+x}$



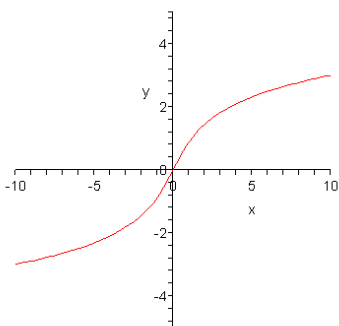
Lichá fce.

f)
 $\frac{e^x - 1}{e^x + 1}$



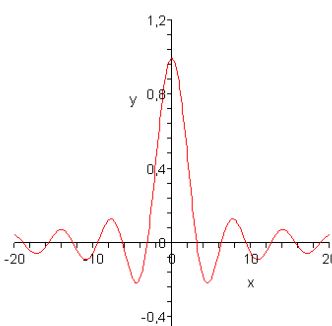
Lichá fce.

g)
 $\log(\sqrt{x^2 + 1} + x)$



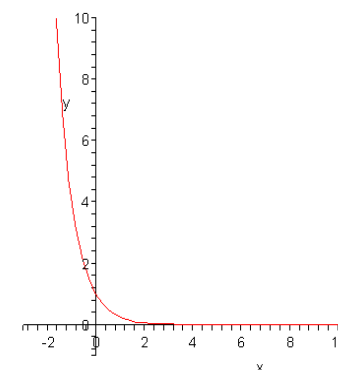
Lichá fce.

h)
 $\frac{\sin x}{x}$



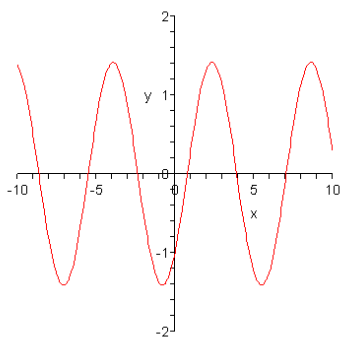
Sudá fce.

i)
 2^{-x^2}



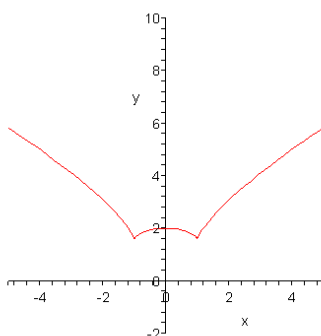
Sudá fce.

j)
 $\sin x - \cos x$



Sudá fce.

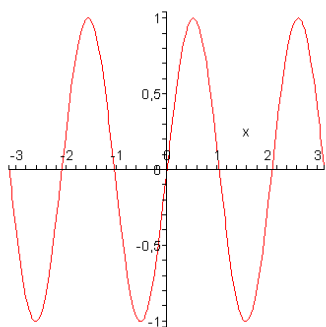
k)
 $\sqrt[3]{(1-x)^2} + \sqrt[3]{(1+x)^2}$



Sudá fce.

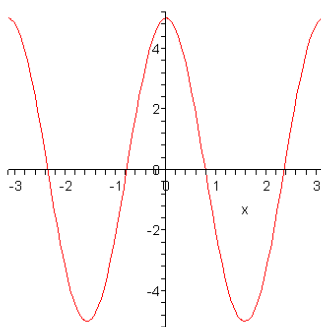
str. 43, př. 6

a)
 $\sin(3x)$



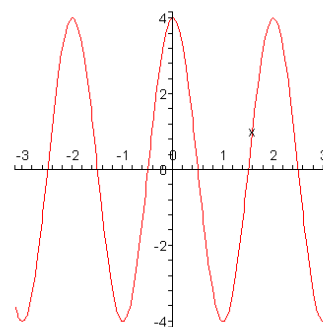
Funkce je periodická
s periodou $T = \frac{2}{3}\pi$.

b)
 $5\cos(2x)$



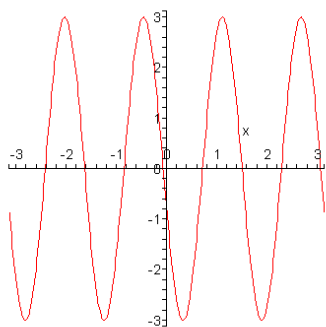
Funkce je periodická
s periodou $T = \pi$.

c)
 $4\sin(\pi x)$



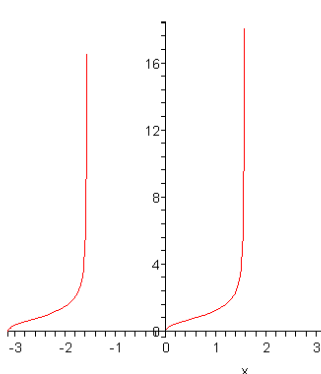
Funkce je periodická
s periodou $T = 1$.

d)
 $-3\cos(4x+5)$



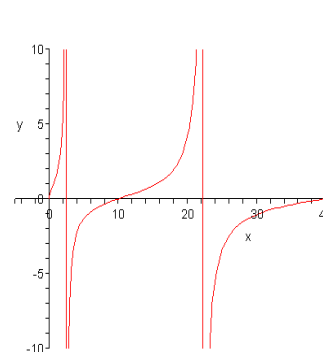
Funkce je periodická
s periodou $T = \frac{1}{2}\pi$.

e)
 $\sqrt{\tan(x)}$



Funkce je periodická
s periodou $T = \pi$.

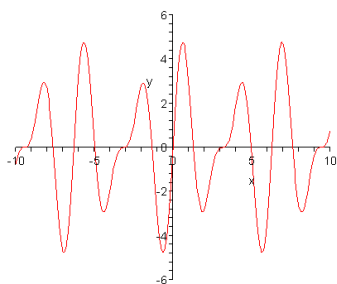
f)
 $\tan \sqrt{x}$



Funkce není periodická.

g)

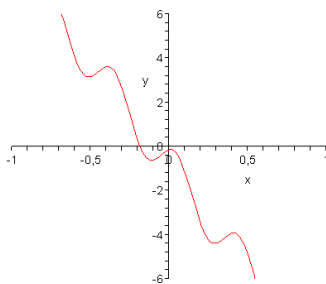
$$2\sin(3x) + 3\sin(2x)$$



Funkce je periodická
s periodou $T = 2\pi$.

h)

$$\sin\left(5\pi x + \frac{\pi}{4}\right) - \cos\frac{\pi}{6} - 3\pi x$$



Funkce je periodická
s periodou $T = 2$.