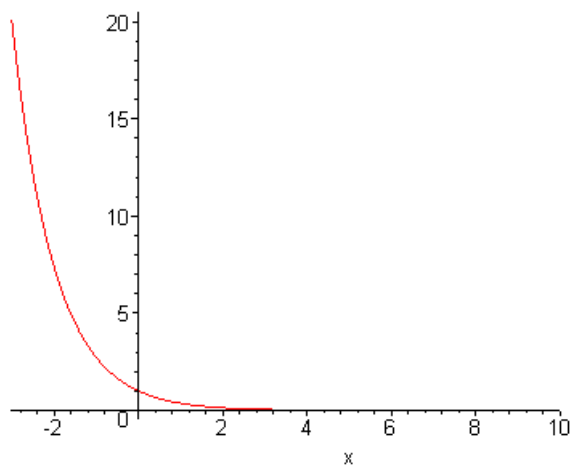


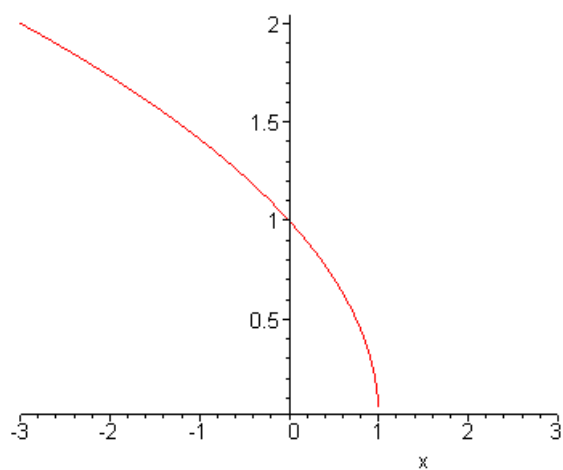
Řešení

Písemná práce z matematiky za 1. semestr – A

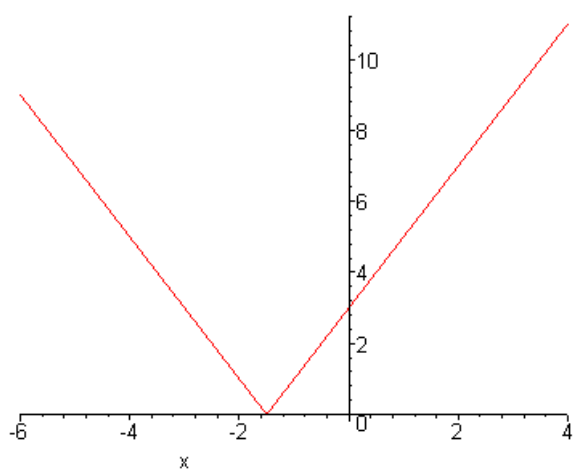
$$y = \frac{1}{e^x}$$



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



$$y = |2x + 3|$$



$$3. f(x) = x + \frac{3x^3 - 10x^2 - 6x - 5}{2x^4 - x^3 - 4x^2 - 3x - 2} = x + \frac{2}{x+1} - \frac{1}{x-2} + \frac{x}{2x^2 + x + 1}$$

$$4. f'(x) = -\frac{\frac{2x^3}{\sqrt{1+x^2}} - 4x\sqrt{1+x^2}}{4x^4} + \frac{1}{2} \frac{x}{1+\sqrt{1+x^2}} \cdot \frac{\frac{x^2}{\sqrt{1+x^2}} - (1+\sqrt{1+x^2})}{x^2}$$

$$\text{event. } \ln \frac{a}{b} = \ln a - \ln b$$

$$= \frac{2+x^2}{2x^3\sqrt{1+x^2}} - \frac{1}{x\sqrt{1+x^2}} = \frac{1}{x^3\sqrt{1+x^2}}; D(f) = D(f') = (0, \infty)$$

$$5. X \cdot A = B \Rightarrow X = B \cdot A^{-1}, \quad |A| = 1, \quad \text{adj}(A) = \begin{pmatrix} 1 & 0 & -1 \\ 4 & -2 & -5 \\ 2 & -1 & -3 \end{pmatrix}$$

$$X = \begin{pmatrix} 2 & -3 & -1 \\ 0 & 1 & 0 \end{pmatrix} \begin{pmatrix} 1 & 0 & -1 \\ 4 & -2 & -5 \\ 2 & -1 & -3 \end{pmatrix} = \begin{pmatrix} -12 & 7 & 16 \\ 4 & -2 & -5 \end{pmatrix}$$

$$6. D(f) = \mathbf{R} - \left\{ \frac{1}{3} \right\} \quad \begin{array}{c} + \quad \quad \quad - \quad \quad \quad + \\ \hline \quad \quad \quad -1/3 \quad \quad \quad 0 \end{array}$$

$$y' = \frac{3}{18x^2 + 6x + 1} \quad \begin{array}{c} \quad \quad \quad + \quad \quad \quad + \\ \hline \quad \quad \quad -1/3 \end{array}$$

$$y'' = -18 \frac{6x+1}{(18x^2+6x+1)^2} \quad \begin{array}{c} \quad \quad \quad + \quad \quad \quad + \quad \quad \quad - \\ \hline \quad \quad \quad -1/3 \quad -1/6 \end{array}$$

$$\lim_{x \rightarrow \frac{1}{3}^+} f(x) = -P/2$$

$$\lim_{x \rightarrow \frac{1}{3}^-} f(x) = P/2$$

$$\lim_{x \rightarrow \pm\infty} f(x) = P/4$$

