

Pátá série úloh z předmětu AN1E

1. Řešte rovnice

(a)

$$\log_2(x + 7) - \log_2 x = 3$$

(b)

$$\log_2 \frac{3 - x}{x + 3} = -2$$

(c)

$$\frac{\log_3(6x - 1)}{\log_3(x - 3)} = 2$$

(d)

$$4 \log_9 x (\log_9 x - 1) = 2 + 3 \log_9 x$$

(e)

$$\frac{\log x}{\log(x - 2)} = \frac{\log 9}{\log 3}$$

2. Vypočtěte limity

(a)

$$\lim_{x \rightarrow \frac{\pi}{2}^+} \operatorname{tg} x, \quad \lim_{x \rightarrow \frac{\pi}{2}^-} \operatorname{tg} x, \quad \lim_{x \rightarrow \frac{\pi}{2}} \operatorname{tg} x.$$

(b)

$$\lim_{x \rightarrow \frac{\pi}{2}^+} (\operatorname{tg} x + \sqrt{x}), \quad \lim_{x \rightarrow \frac{\pi}{2}^-} (\operatorname{tg} x + \sqrt{x}), \quad \lim_{x \rightarrow \frac{\pi}{2}} (\operatorname{tg} x + \sqrt{x}).$$

(c)

$$\lim_{x \rightarrow \frac{\pi}{2}^+} 2^{\operatorname{tg} x}, \quad \lim_{x \rightarrow \frac{\pi}{2}^-} 2^{\operatorname{tg} x}, \quad \lim_{x \rightarrow \frac{\pi}{2}} 2^{\operatorname{tg} x}.$$

(d)

$$\lim_{x \rightarrow \frac{\pi}{2}^+} (2^{\operatorname{tg} x} - 3 \log x), \quad \lim_{x \rightarrow \frac{\pi}{2}^-} (2^{\operatorname{tg} x} - 3 \log x), \quad \lim_{x \rightarrow \frac{\pi}{2}} (2^{\operatorname{tg} x} - 3 \log x).$$

(e)

$$\lim_{x \rightarrow 2^+} \frac{\cos x - x}{2x^2 - x - 6}, \quad \lim_{x \rightarrow 2^-} \frac{\cos x - x}{2x^2 - x - 6}, \quad \lim_{x \rightarrow 2} \frac{\cos x - x}{2x^2 - x - 6}$$

(f)

$$\lim_{x \rightarrow 1^+} \frac{1}{\log|x-1|}, \quad \lim_{x \rightarrow 1^-} \frac{1}{\log|x-1|}, \quad \lim_{x \rightarrow 1} \frac{1}{\log|x-1|}.$$

(g)

$$\lim_{x \rightarrow 0^+} \cos(\operatorname{sgn}x), \quad \lim_{x \rightarrow 0^-} \cos(\operatorname{sgn}x), \quad \lim_{x \rightarrow 0} \cos(\operatorname{sgn}x).$$