

1. Vypočítajte:

a.  $\cos \frac{5}{6} \pi =$

b.  $\sin \frac{5}{4} \pi =$

c.  $\cos \frac{7}{2} \pi =$

d.  $\cos(-\frac{2}{3} \pi) =$

e.  $\cos \frac{11}{6} \pi =$

f.  $\sin 330^\circ =$

g.  $\cos \frac{9}{4} \pi =$

h.  $\cos 135^\circ =$

i.  $\sin \frac{5}{6} \pi =$

j.  $\sin (-1350^\circ) =$

k.  $\sin (-\frac{\pi}{6}) =$

l.  $\cos (-120^\circ) =$

m.  $\sin \frac{4}{3} \pi =$

n.  $\cos 315^\circ =$

2. Vypočítajte:

a.  $\operatorname{tg} \frac{5}{6} \pi =$

b.  $\operatorname{cotg} \frac{5}{4} \pi =$

c.  $\operatorname{cotg} \frac{7}{2} \pi =$

d.  $\operatorname{tg}(-\frac{2}{3} \pi) =$

e.  $\operatorname{tg} \frac{11}{6} \pi =$

f.  $\operatorname{cotg} 330^\circ =$

g.  $\operatorname{tg} \frac{9}{4} \pi =$

h.  $\operatorname{cotg} 135^\circ =$

i.  $\operatorname{tg} \frac{5}{6} \pi =$

j.  $\operatorname{tg} (-1350^\circ) =$

k.  $\operatorname{tg} (-\frac{\pi}{6}) =$

l.  $\operatorname{cotg} (-120^\circ) =$

m.  $\operatorname{cotg} \frac{4}{3} \pi =$

n.  $\operatorname{tg} 315^\circ =$

3. Bez výpočtu hodnoty  $x$  vypočítajte hodnoty ostatných goniometrických funkcií, ak viete, že:

a.  $\sin x = -\frac{2}{3}$ ; kde  $x \in (\frac{3\pi}{2}, 2\pi)$

b.  $\cos x = \frac{12}{13}$ ; kde  $x \in (0, \frac{\pi}{2})$

c.  $\operatorname{tg} x = 1,25$ ; kde  $x \in (\pi, \frac{3\pi}{2})$

d.  $\operatorname{cotg} x = -\frac{9}{40}$ ; kde  $x \in (\frac{\pi}{2}, \pi)$

4. Vyhľadajte v  $\mathbb{R}$  rovnice:

a.  $\sin x = \frac{\sqrt{3}}{2}$

b.  $2 \cos x = \sqrt{2}$

c.  $-\sin \frac{x}{2} = \frac{1}{\sqrt{2}}$

d.  $\sin (3x) = -\frac{\sqrt{3}}{2}$

e.  $\operatorname{tg} (2x) = -1$

f.  $\operatorname{cotg} (x + \frac{\pi}{4}) = 0$

g.  $2 \cos (4x - \frac{\pi}{2}) = 1$

h.  $-6 \operatorname{tg} \frac{x}{5} = 2\sqrt{3}$

i.  $\cos (\frac{x}{2} - \frac{\pi}{8}) = -1$

j.  $-\sqrt{3} \operatorname{cotg} (3x) = 3$

k.  $\cos x + 2 \sin x \cdot \cos x = 0$

l.  $2 \sin^2 x + \sin x = 1$

m.  $3 \operatorname{tg} x - \operatorname{cotg} x = 0$

n.  $\frac{\operatorname{tg} x}{\operatorname{cotg} x} = \operatorname{tg} x$

5. Určte, za akých podmienok sú nasledujúce výrazy definované a čo najviac ich zjednodušte:

a.  $\sin x \cdot \cos^2 x + \sin^3 x =$

b.  $\sin x - \sin x \cdot \cos^2 x =$

c.  $\cos x - \cos x \cdot \sin^2 x =$

d.  $\frac{\cos^2 x}{1 + \sin x} =$

e.  $\frac{\sin^2 x}{1 - \cos x} =$

f.  $\frac{1}{\sin^2 x} - 1 =$

g.  $\frac{\sin^3 x}{\cos x - \cos^3 x} =$

h.  $\frac{\sin - \sin^3 x}{\cos x - \cos^3 x} =$

i.  $\frac{1 - \sin^2 x}{\cot^2 x} =$

Výsledky:

1.

a.  $\cos \frac{5}{6} \pi = -\frac{\sqrt{3}}{2}$   
b.  $\sin \frac{5}{4} \pi = -\frac{\sqrt{2}}{2}$   
c.  $\cos \frac{7}{2} \pi = 0$   
d.  $\cos(-\frac{2}{3} \pi) = -\frac{1}{2}$   
e.  $\cos \frac{11}{6} \pi = \frac{\sqrt{3}}{2}$   
f.  $\sin 330^\circ = -\frac{1}{2}$   
g.  $\cos \frac{9}{4} \pi = \frac{\sqrt{2}}{2}$

h.  $\cos 135^\circ = -\frac{\sqrt{2}}{2}$   
i.  $\sin \frac{5}{6} \pi = \frac{1}{2}$   
j.  $\sin(-1350^\circ) = 1$   
k.  $\sin(-\frac{\pi}{6}) = -\frac{1}{2}$   
l.  $\cos(-120^\circ) = -\frac{1}{2}$   
m.  $\sin \frac{4}{3} \pi = -\frac{\sqrt{3}}{2}$   
n.  $\cos 315^\circ = \frac{\sqrt{2}}{2}$

2.

a.  $\operatorname{tg} \frac{5}{6} \pi = -\frac{\sqrt{3}}{3}$   
b.  $\operatorname{cotg} \frac{5}{4} \pi = 1$   
c.  $\operatorname{cotg} \frac{7}{2} \pi = 0$   
d.  $\operatorname{tg}(-\frac{2}{3} \pi) = \sqrt{3}$   
e.  $\operatorname{tg} \frac{11}{6} \pi = -\frac{\sqrt{3}}{3}$   
f.  $\operatorname{cotg} 330^\circ = -\sqrt{3}$   
g.  $\operatorname{tg} \frac{9}{4} \pi = 1$

h.  $\operatorname{cotg} 135^\circ = -1$   
i.  $\operatorname{cotg} \frac{5}{6} \pi = -\sqrt{3}$   
j.  $\operatorname{tg}(-1350^\circ) = \text{neexistuje}$   
k.  $\operatorname{tg}(-\frac{\pi}{6}) = -\frac{\sqrt{3}}{3}$   
l.  $\operatorname{cotg}(-120^\circ) = \frac{\sqrt{3}}{3}$   
m.  $\operatorname{cotg} \frac{4}{3} \pi = \frac{\sqrt{3}}{3}$   
n.  $\operatorname{tg} 315^\circ = -1$

3.

a.  $\cos x = \frac{\sqrt{5}}{3}; \operatorname{tg} x = -\frac{2\sqrt{5}}{5}; \operatorname{cotg} x = -\frac{\sqrt{5}}{2}$   
b.  $\sin x = \frac{5}{13}; \operatorname{tg} x = \frac{5}{12}; \operatorname{cotg} x = \frac{12}{5}$   
c.  $\sin x = -\frac{5\sqrt{41}}{41}; \cos x = -\frac{4\sqrt{41}}{41}; \operatorname{cotg} x = 0,8$   
d.  $\sin x = \frac{40}{41}; \cos x = -\frac{9}{41}; \operatorname{tg} x = -\frac{40}{9}$

4.

a.  $K = \left\{ \frac{\pi}{3} + k \cdot 2\pi; \frac{2\pi}{3} + k \cdot 2\pi \right\}, k \in Z$   
b.  $K = \left\{ \frac{\pi}{4} + k \cdot 2\pi; \frac{7\pi}{4} + k \cdot 2\pi \right\}, k \in Z$   
c.  $K = \left\{ \frac{5\pi}{2} + k \cdot 4\pi; \frac{7\pi}{2} + k \cdot 4\pi \right\}, k \in Z$   
d.  $K = \left\{ \frac{4\pi}{9} + k \cdot \frac{2\pi}{3}; \frac{5\pi}{9} + k \cdot \frac{2\pi}{3} \right\}, k \in Z$   
e.  $K = \left\{ \frac{3\pi}{8} + k \cdot \frac{\pi}{2} \right\}, k \in Z$   
f.  $K = \left\{ \frac{\pi}{4} + k \cdot \pi \right\}, k \in Z$   
g.  $K = \left\{ \frac{5\pi}{24} + k \cdot \frac{\pi}{2}; \frac{7\pi}{24} + k \cdot \frac{\pi}{2} \right\}, k \in Z$   
h.  $K = \left\{ \frac{25\pi}{6} + k \cdot 5\pi \right\}, k \in Z$   
i.  $K = \left\{ \frac{9\pi}{4} + 4k\pi \right\}, k \in Z$   
j.  $K = \left\{ \frac{5\pi}{18} + k \cdot \frac{\pi}{3} \right\}, k \in Z$   
k.  $K = \left\{ \frac{\pi}{2} + k \cdot 2\pi; \frac{3\pi}{2} + k \cdot 2\pi; \frac{7\pi}{6} + k \cdot 2\pi; \frac{11\pi}{6} + k \cdot 2\pi \right\}, k \in Z$

$$l. \quad K = \left\{ \frac{3\pi}{2} + k \cdot 2\pi; \frac{\pi}{6} + k \cdot 2\pi; \frac{5\pi}{6} + k \cdot 2\pi \right\}, k \in Z$$

$$m. \quad K = \left\{ \frac{\pi}{6} + k \cdot \pi; \frac{5\pi}{6} + k \cdot \pi \right\}, k \in Z$$

$$n. \quad K = \left\{ \frac{\pi}{4} + k \cdot \pi \right\}, k \in Z$$

5.

$$a. \quad \sin x; x \in \mathbb{R}$$

$$b. \quad \sin^3 x; x \in \mathbb{R}$$

$$c. \quad \cos^3 x; x \in \mathbb{R}$$

$$d. \quad 1 - \sin x; x \in \mathbb{R} - \left\{ \frac{3\pi}{2} + 2k\pi \right\}$$

$$e. \quad 1 + \cos x; x \in \mathbb{R} - \{2k\pi\}$$

$$f. \quad \cotg^2 x; x \in \mathbb{R} - \{k\pi\}$$

$$g. \quad \tg x; x \in \mathbb{R} - \left\{ \frac{\pi}{2} + k\pi; k\pi \right\}$$

$$h. \quad \cotg x; x \in \mathbb{R} - \left\{ \frac{\pi}{2} + k\pi; k\pi \right\}$$

$$i. \quad \sin^2 x; x \in \mathbb{R} - \{k\pi\}$$