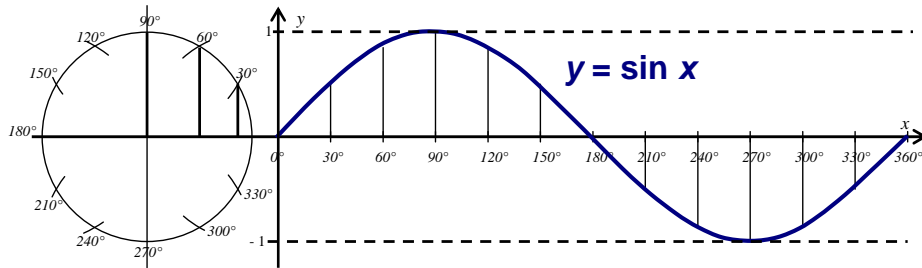


Sinus, Cosinus (4)

1. Konstrukce funkce $y = \sin x$



2. Hodnoty $\sin x$

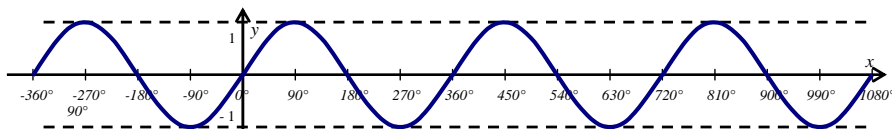
1) Určete funkční hodnoty:

$$\begin{aligned} \sin 45^\circ &= \\ \sin 60^\circ &= \\ \sin 315^\circ &= \\ \sin 180^\circ &= \\ \sin 210^\circ &= \\ \sin 45^\circ &= \frac{\sqrt{2}}{2} \\ \sin 60^\circ &= \frac{\sqrt{3}}{2} \\ \sin 315^\circ &= -\frac{\sqrt{2}}{2} \\ \sin 180^\circ &= 0 \\ \sin 210^\circ &= -\frac{1}{2} \end{aligned}$$

2) Určete funkční hodnoty:

$$\begin{aligned} \sin 300^\circ &= \\ \sin 135^\circ &= \\ \sin 270^\circ &= \\ \sin 330^\circ &= \\ \sin 120^\circ &= \\ \sin 300^\circ &= -\frac{\sqrt{3}}{2} \\ \sin 135^\circ &= \frac{\sqrt{2}}{2} \\ \sin 270^\circ &= -1 \\ \sin 330^\circ &= -\frac{1}{2} \\ \sin 120^\circ &= \frac{\sqrt{3}}{2} \end{aligned}$$

3. Vlastnosti funkce $y = \sin x$



2) Určete funkční hodnoty:

$$\begin{aligned} \sin 315^\circ &= \\ \sin 240^\circ &= \\ \sin 225^\circ &= \\ \sin 360^\circ &= \\ \sin 150^\circ &= \\ \sin 315^\circ &= -\frac{\sqrt{2}}{2} \\ \sin 240^\circ &= -\frac{\sqrt{3}}{2} \\ \sin 225^\circ &= -\frac{\sqrt{2}}{2} \\ \sin 360^\circ &= 0 \\ \sin 150^\circ &= \frac{1}{2} \end{aligned}$$

4) Určete funkční hodnoty:

$$\begin{aligned} \sin 120^\circ &= \\ \sin 45^\circ &= \\ \sin 300^\circ &= \\ \sin 90^\circ &= \\ \sin 30^\circ &= \\ \sin 120^\circ &= \frac{\sqrt{3}}{2} \\ \sin 45^\circ &= \frac{\sqrt{2}}{2} \\ \sin 300^\circ &= -\frac{\sqrt{3}}{2} \\ \sin 90^\circ &= 1 \\ \sin 30^\circ &= \frac{1}{2} \end{aligned}$$

4. Hodnoty $\sin x$ - posunuté

1) Určete funkční hodnoty:

$$\begin{aligned} \sin(-120^\circ) &= \\ \sin 1485^\circ &= \\ \sin 1890^\circ &= \\ \sin(-750^\circ) &= \\ \sin(-120^\circ + 360^\circ) &= \sin 240^\circ = -\frac{\sqrt{3}}{2} \\ \sin(1485^\circ - 1440^\circ) &= \sin 45^\circ = \frac{\sqrt{2}}{2} \\ \sin(1890^\circ - 1800^\circ) &= \sin 90^\circ = 1 \\ \sin(-750^\circ + 1080^\circ) &= \sin 330^\circ = -\frac{1}{2} \end{aligned}$$

2) Určete funkční hodnoty:

$$\begin{aligned} \sin(-1050^\circ) &= \\ \sin(-60^\circ) &= \\ \sin 1665^\circ &= \\ \sin 1800^\circ &= \\ \sin(-1050^\circ + 1080^\circ) &= \sin 30^\circ = \frac{1}{2} \\ \sin(-60^\circ + 360^\circ) &= \sin 300^\circ = -\frac{\sqrt{3}}{2} \\ \sin(1665^\circ - 1440^\circ) &= \sin 225^\circ = -\frac{\sqrt{2}}{2} \\ \sin(1800^\circ - 1800^\circ) &= \sin 0^\circ = 0 \end{aligned}$$

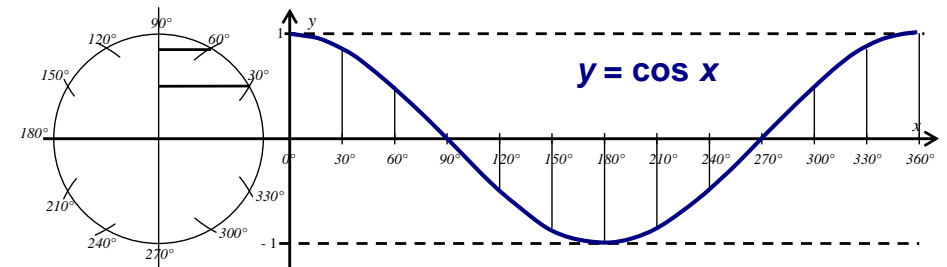
3) Určete funkční hodnoty:

$$\begin{aligned} \sin 2070^\circ &= \\ \sin(-930^\circ) &= \\ \sin(-300^\circ) &= \\ \sin 1575^\circ &= \\ \sin(2070^\circ - 1800^\circ) &= \sin 270^\circ = -1 \\ \sin(-930^\circ + 1080^\circ) &= \sin 150^\circ = \frac{1}{2} \\ \sin(-300^\circ + 360^\circ) &= \sin 60^\circ = \frac{\sqrt{3}}{2} \\ \sin(1575^\circ - 1440^\circ) &= \sin 135^\circ = \frac{\sqrt{2}}{2} \end{aligned}$$

4) Určete funkční hodnoty:

$$\begin{aligned} \sin(-240^\circ) &= \\ \sin 1755^\circ &= \\ \sin 1980^\circ &= \\ \sin(-930^\circ) &= \\ \sin(-240^\circ + 360^\circ) &= \sin 120^\circ = \frac{\sqrt{3}}{2} \\ \sin(1755^\circ - 1440^\circ) &= \sin 315^\circ = -\frac{\sqrt{2}}{2} \\ \sin(1980^\circ - 1800^\circ) &= \sin 180^\circ = 0 \\ \sin(-930^\circ + 1080^\circ) &= \sin 150^\circ = \frac{1}{2} \end{aligned}$$

5. Konstrukce funkce $y = \cos x$



6. Hodnoty $\cos x$

1) Určete funkční hodnoty:

$$\begin{aligned} \cos 240^\circ &= \\ \cos 60^\circ &= \\ \cos 90^\circ &= \\ \cos 315^\circ &= \\ \cos 150^\circ &= \\ \cos 240^\circ &= -\frac{1}{2} \\ \cos 60^\circ &= \frac{1}{2} \\ \cos 90^\circ &= 0 \\ \cos 315^\circ &= \frac{\sqrt{2}}{2} \\ \cos 150^\circ &= -\frac{\sqrt{3}}{2} \end{aligned}$$

2) Určete funkční hodnoty:

$$\begin{aligned} \cos 330^\circ &= \\ \cos 210^\circ &= \\ \cos 135^\circ &= \\ \cos 300^\circ &= \\ \cos 180^\circ &= \\ \cos 330^\circ &= \frac{\sqrt{3}}{2} \\ \cos 210^\circ &= -\frac{\sqrt{3}}{2} \\ \cos 135^\circ &= -\frac{\sqrt{2}}{2} \\ \cos 300^\circ &= \frac{1}{2} \\ \cos 180^\circ &= -1 \end{aligned}$$

3) Určete funkční hodnoty:

$$\cos 150^\circ =$$

$$\cos 225^\circ =$$

$$\cos 240^\circ =$$

$$\cos 30^\circ =$$

$$\cos 270^\circ =$$

$$\cos 150^\circ = -\frac{\sqrt{3}}{2}$$

$$\cos 225^\circ = -\frac{\sqrt{2}}{2}$$

$$\cos 240^\circ = -\frac{1}{2}$$

$$\cos 30^\circ = \frac{\sqrt{3}}{2}$$

$$\cos 270^\circ = 0$$

4) Určete funkční hodnoty:

$$\cos 135^\circ =$$

$$\cos 150^\circ =$$

$$\cos 45^\circ =$$

$$\cos 330^\circ =$$

$$\cos 360^\circ =$$

$$\cos 135^\circ = -\frac{\sqrt{2}}{2}$$

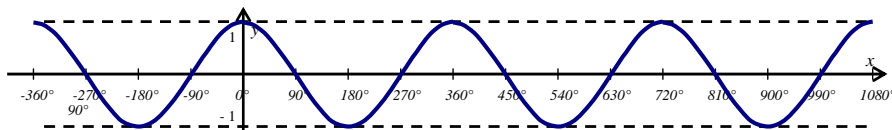
$$\cos 150^\circ = -\frac{\sqrt{3}}{2}$$

$$\cos 45^\circ = \frac{\sqrt{2}}{2}$$

$$\cos 330^\circ = \frac{\sqrt{3}}{2}$$

$$\cos 360^\circ = 1$$

7. Vlastnosti funkce $y = \cos x$



8. Hodnoty $\cos x$ - posunuté

1) Určete funkční hodnoty:

$$\cos(-270^\circ) =$$

$$\cos 1140^\circ =$$

$$\cos 1755^\circ =$$

$$\cos 1590^\circ =$$

$$\cos(-270^\circ + 360^\circ) = \cos 90^\circ = 0$$

$$\cos(1140^\circ - 1080^\circ) = \cos 60^\circ = \frac{1}{2}$$

$$\cos(1755^\circ - 1440^\circ) = \cos 315^\circ = \frac{\sqrt{2}}{2}$$

$$\cos(1590^\circ - 1440^\circ) = \cos 150^\circ = -\frac{\sqrt{3}}{2}$$

2) Určete funkční hodnoty:

$$\cos(-900^\circ) =$$

$$\cos(-60^\circ) =$$

$$\cos 495^\circ =$$

$$\cos(-690^\circ) =$$

$$\cos(-900^\circ + 1080^\circ) = \cos 180^\circ = -1$$

$$\cos(-60^\circ + 360^\circ) = \cos 300^\circ = \frac{1}{2}$$

$$\cos(495^\circ - 360^\circ) = \cos 135^\circ = -\frac{\sqrt{2}}{2}$$

$$\cos(-690^\circ + 720^\circ) = \cos 30^\circ = \frac{\sqrt{3}}{2}$$

3) Určete funkční hodnoty:

$$\cos(-495^\circ) =$$

$$\cos 990^\circ =$$

$$\cos(-870^\circ) =$$

$$\cos 1560^\circ =$$

$$\cos(-495^\circ + 720^\circ) = \cos 225^\circ = -\frac{\sqrt{2}}{2}$$

$$\cos(990^\circ - 720^\circ) = \cos 270^\circ = 0$$

$$\cos(-870^\circ + 1080^\circ) = \cos 210^\circ = -\frac{\sqrt{3}}{2}$$

$$\cos(1560^\circ - 1440^\circ) = \cos 120^\circ = -\frac{1}{2}$$

4) Určete funkční hodnoty:

$$\cos(-510^\circ) =$$

$$\cos(-1395^\circ) =$$

$$\cos 690^\circ =$$

$$\cos 1800^\circ =$$

$$\cos(-510^\circ + 720^\circ) = \cos 210^\circ = -\frac{\sqrt{3}}{2}$$

$$\cos(-1395^\circ + 1440^\circ) = \cos 45^\circ = \frac{\sqrt{2}}{2}$$

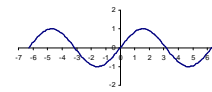
$$\cos(690^\circ - 360^\circ) = \cos 330^\circ = \frac{\sqrt{3}}{2}$$

$$\cos(1800^\circ - 1800^\circ) = \cos 360^\circ = 1$$

9. Vlastnosti goniometrických funkcí

1) Určete vlastnosti funkce

$$g: y = \sin x$$



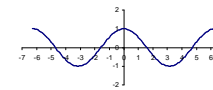
$$D(f) = (-\infty; \infty), H(f) = \langle -1; 1 \rangle$$

$$\text{VH: } r\langle -90^\circ + k360^\circ; 90^\circ + k360^\circ \rangle; k\langle 90^\circ + k360^\circ; 270^\circ + k360^\circ \rangle$$

$$P_x = [k180^\circ; 0]; P_y = [0; 0]$$

2) Určete vlastnosti funkce

$$h: y = \cos x$$



$$D(f) = (-\infty; \infty); H(f) = \langle -1; 1 \rangle$$

$$\text{VH: } r\langle 180^\circ + k360^\circ; 360^\circ + k360^\circ \rangle; k\langle 0 + k360^\circ; 180^\circ + k360^\circ \rangle$$

$$P_x = [90^\circ + k180^\circ; 0]; P_y = [0; 1]$$