

Hoofdstuk 6: Goniometrische formules.

6.1 Eenheidscirkel en radiaal

Opgave 1:

a. $\sin 65^\circ = \frac{PQ}{1}$

$$PQ = \sin 65^\circ = 0,91$$

$$OQ = \cos 65^\circ = 0,42$$

b. $P(0,42;0,91)$

c. $\angle POQ = 65^\circ$

$$PQ = 0,91$$

$$OQ = 0,42$$

$$P(-0,42;0,91)$$

d. $\cos 115^\circ = -0,42$

$$\sin 115^\circ = 0,91$$

$$\cos 115^\circ = -\cos 65^\circ$$

$$\sin 115^\circ = \sin 65^\circ$$

Opgave 2:

a. 0

b. 1

c. 1

d. 0

e. -1

f. 0

g. 0

h. 1

i. 1

j. 0

k. 0

l. -1

Opgave 3:

a. $\sin 210^\circ = -\sin 30^\circ = -\frac{1}{2}$

b. $\cos 210^\circ = -\cos 30^\circ = -\frac{1}{2}\sqrt{3}$

c. $\sin(-135^\circ) = -\sin 45^\circ = -\frac{1}{2}\sqrt{2}$

d. $\cos(-135^\circ) = -\cos 45^\circ = -\frac{1}{2}\sqrt{2}$

e. $\sin 300^\circ = -\sin 60^\circ = -\frac{1}{2}\sqrt{3}$

f. $\cos 300^\circ = \cos 60^\circ = \frac{1}{2}$

Opgave 4:

a. klopt

b. $x_P = \cos 110^\circ = -0,34$ $y_P = \sin 110^\circ = 0,94$

$x_Q = \cos 200^\circ = -0,94$ $y_Q = \sin 200^\circ = -0,34$

$$x_R = \cos(-102^\circ) = -0,21$$

$$x_S = \cos(-50^\circ) = 0,64$$

$$y_R = \sin(-102^\circ) = -0,98$$

$$y_S = \sin(-50^\circ) = -0,77$$

Opgave 5:

$$x_B = 2 \cos 72^\circ = 0,62$$

$$x_C = 2 \cos 144^\circ = -1,62$$

$$x_D = 2 \cos 216^\circ = -1,62$$

$$x_E = 2 \cos 288^\circ = 0,62$$

$$y_B = 2 \sin 72^\circ = 1,90$$

$$y_C = 2 \sin 144^\circ = 1,18$$

$$y_D = 2 \sin 216^\circ = -1,18$$

$$y_E = 2 \sin 288^\circ = -1,90$$

Opgave 6:

a. $omtrek = 2\pi r = 2 \cdot \pi \cdot 1 = 2\pi$

b. bij 90° hoort een kwart cirkel dus $boog = \frac{1}{4} \cdot 2\pi = \frac{1}{2}\pi$

c. $\frac{1}{2} \cdot omtrek = \frac{1}{2} \cdot 2\pi = \pi$

d. $a \cdot omtrek = 1\frac{1}{2}\pi$

$$a \cdot 2\pi = 1\frac{1}{2}\pi$$

$$a = \frac{3}{4}$$

$$\text{dus } \frac{3}{4} \cdot 360^\circ = 270^\circ$$

Opgave 7:

a. 30°

b. 45°

c. 360°

d. $\frac{360}{\pi} = 114,6^\circ$

e. 225°

f. $\frac{225}{\pi} = 71,6^\circ$

g. -400°

h. $-127,3^\circ$

Opgave 8:

a. 2π

b. $\frac{1}{6}\pi$

c. $\frac{1}{4}\pi$

d. $\frac{1}{3}\pi$

e. $\frac{1}{2}\pi$

f. $\frac{3}{4}\pi$

g. $1\frac{2}{3}\pi$

h. $1\frac{1}{6}\pi$

Opgave 9:

a. $\frac{10}{360} \cdot 2\pi = 0,17$

- b. $\frac{57,3}{360} \cdot 2\pi = 1,00$
 c. $\frac{1030}{360} \cdot 2\pi = 17,98$
 d. $\frac{90}{360} \cdot 2\pi = 1,57$

Opgave 10:

- a. $-0,38$
 b. $0,81$
 c. $0,59$
 d. $0,72$
 e. $0,31$
 f. $0,25$

Opgave 11:

- a. $x_p = \cos 5 = 0,28$
 $y_p = \sin 5 = -0,96$
 b. $x_p = \cos 6 = 0,96$
 $y_p = \sin 6 = -0,28$
 c. $x_p = \cos 20 = 0,41$
 $y_p = \sin 20 = 0,91$

Opgave 12:

- a. $\frac{1}{2}\sqrt{3}$
 b. $\frac{1}{2}\sqrt{2}$

Opgave 13:

- a. $\sin \frac{3}{4}\pi = \sin \frac{1}{4}\pi = \frac{1}{2}\sqrt{2}$
 b. $\cos \frac{7}{6}\pi = -\cos \frac{1}{6}\pi = -\frac{1}{2}\sqrt{3}$
 c. $\sin 1\frac{1}{3}\pi = -\sin \frac{1}{3}\pi = -\frac{1}{2}\sqrt{3}$
 d. $\cos \frac{5}{3}\pi = \cos \frac{1}{3}\pi = \frac{1}{2}$
 e. $\cos 1\frac{1}{3}\pi = -\cos \frac{1}{3}\pi = -\frac{1}{2}$
 f. $\sin -\frac{1}{4}\pi = -\sin \frac{1}{4}\pi = -\frac{1}{2}\sqrt{2}$

Opgave 14:

- a. $\alpha = \frac{1}{3}\pi \quad \vee \quad \alpha = \frac{2}{3}\pi$
 b. $\alpha = \frac{2}{3}\pi \quad \vee \quad \alpha = 1\frac{1}{3}\pi$
 c. $\alpha = 1\frac{1}{4}\pi \quad \vee \quad \alpha = 1\frac{3}{4}\pi$
 d. $\alpha = \frac{1}{2}\pi \quad \vee \quad \alpha = 1\frac{1}{2}\pi$
 e. $\alpha = \frac{1}{6}\pi \quad \vee \quad \alpha = 1\frac{5}{6}\pi$
 f. $\alpha = \frac{1}{4}\pi \quad \vee \quad \alpha = 1\frac{1}{4}\pi$