

2. Bez

Kreis

Lösungen AB 7

1. a) $A_{total} = A_{grosser\ Halbkreis} + A_{mittlerer\ Halbkreis} - A_{kleiner\ Kreis}$

$$A_{total} = \frac{a^2\pi}{2} + \frac{\left(\frac{a}{2}\right)^2\pi}{2} - \left(\frac{a}{4}\right)^2\pi = \frac{a^2\pi}{2} + \frac{a^2\pi}{8} - \frac{a^2\pi}{16} = \frac{8a^2\pi}{16} + \frac{2a^2\pi}{16} - \frac{a^2\pi}{16} = \frac{9a^2\pi}{16}$$

$$u_{total} = u_{grosser\ Halbkreis} + u_{mittlerer\ Halbkreis} + u_{kleiner\ Kreis}$$

$$u_{total} = \frac{2a\pi}{2} + \frac{a\pi}{2} + \frac{a\pi}{2} = \frac{4a\pi}{2} = \underline{\underline{2a\pi}}$$

b) $A_{total} = A_{grosser\ Halbkreis} + A_{kleiner\ Halbkreis}$

$$A_{total} = \frac{a^2\pi}{2} + \frac{\left(\frac{a}{3}\right)^2\pi}{2} = \frac{a^2\pi}{2} + \frac{a^2\pi}{18} = \frac{9a^2\pi}{18} + \frac{a^2\pi}{18} = \frac{10a^2\pi}{18} = \frac{5a^2\pi}{9}$$

$$u_{total} = u_{grosser\ Halbkreis} + 3 \cdot u_{kleiner\ Halbkreis}$$

$$u_{total} = \frac{2a\pi}{2} + \frac{3 \cdot \frac{2a}{3} \cdot \pi}{2} = \frac{2a\pi}{2} + \frac{2a\pi}{2} = \frac{4a\pi}{2} = \underline{\underline{2a\pi}}$$

2. $A = \frac{A_S \cdot 360}{36} = 428\text{cm}^2$ $r = \sqrt{\frac{A}{\pi}} = 11,67 \dots \text{cm}$ $b = \frac{2r\pi \cdot \alpha}{360} = \underline{\underline{7,33\text{cm}}}$

3. a) $A = r^2\pi$ $/: \pi$

$$\frac{A}{\pi} = r^2 \quad / \sqrt{\quad}$$

$$\underline{\underline{\sqrt{\frac{A}{\pi}} = r}}$$

b) $b = \frac{2r\pi \cdot \alpha}{360}$ $A_S = \frac{r^2\pi \cdot \alpha}{360}$

4. $s_Q = 95\text{cm}$ $r_K = 47,5\text{cm}$

$$A_Q = s_Q^2 = 9025\text{cm}^2$$

$$A_K = (r_K)^2 \cdot \pi = 7088,2\text{cm}^2$$

$$\frac{(A_Q - A_K)}{A_Q} = \frac{1936,8}{9025} = 0,2146 \dots = \underline{\underline{21,5\%}}$$

5. $A = \frac{A_S \cdot 360}{72} = 28\text{cm}^2$ $d = 2r = 2 \cdot \sqrt{\frac{A}{\pi}} = \underline{\underline{5,97\text{cm}}}$

6. $r = \sqrt{\frac{A}{\pi}} = 4\text{cm}$ $u = 2r\pi = \underline{\underline{25,1\text{cm}}}$

7. $b = \frac{2r\pi \cdot \alpha}{360} = \underline{\underline{20,9\text{cm}}}$

8. $u = \frac{100}{40} = 2,5\text{m}$ $r = \frac{u}{2\pi} = 0,39788 \dots = \underline{\underline{39,8\text{cm}}}$

9. $A = \frac{A_S \cdot 360}{37} = \underline{\underline{486,5\text{cm}^2}}$

10. $\alpha = \frac{A_S \cdot 360}{r^2 \pi} = 72^\circ$ $b = \frac{2r\pi \cdot \alpha}{360} = \underline{\underline{8,8\text{cm}}}$

11. *

$$v = 60\text{km/h} = 1\text{km/min} = 1000\text{m/min}$$

$$u = 2r\pi = 1,822 \dots \text{m} \qquad \frac{1000}{u} = 548,8 \sim \underline{\underline{550 \text{ Umdrehungen/min}}}$$