

HENGER

5.a) Számítsd ki a henger felszínét és térfogatát, ha alapjának átmérője 16 cm, testmagassága pedig 7 cm.



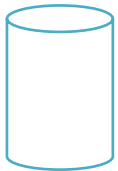
$$\begin{array}{llllll}
 d = 16 \text{ cm} & r = d : 2 & At = r^2 \pi & Pt = 2\pi r H & F = 2At + Pt & V = At \cdot H \\
 H = 7 \text{ cm} & r = 16 : 2 & At = 8^2 \pi & Pt = 2 \cdot 8 \cdot \pi \cdot 7 & F = 2 \cdot 64\pi + 112\pi & V = 64\pi \cdot 7 \\
 F = ? V = ? & r = 8 \text{ cm} & At = 64 \pi \text{ cm}^2 & Pt = 16\pi \cdot 7 & F = 128\pi + 112\pi & V = 448\pi \text{ cm}^3 \\
 At = ? Pt = ? & & & Pt = 112\pi \text{ cm}^2 & F = 240\pi \text{ cm}^2 & \\
 r = ? & & & & & \\
 \text{-----} & & & & &
 \end{array}$$

5.b) Számítsd ki a henger felszínét és térfogatát, ha alapjának sugara $5\sqrt{5}$ cm, testmagassága pedig $2\sqrt{5}$ cm.

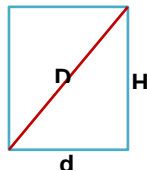


$$\begin{array}{llllll}
 r = 5\sqrt{5} \text{ cm} & At = r^2 \pi & Pt = 2\pi r H & F = 2At + Pt & V = At \cdot H \\
 H = 2\sqrt{5} \text{ cm} & At = (5\sqrt{5})^2 \pi & Pt = 2 \cdot 5\sqrt{5} \cdot \pi \cdot 2\sqrt{5} & F = 2 \cdot 125\pi + 100\pi & V = 125\pi \cdot 2\sqrt{5} \\
 F = ? V = ? At = ? Pt = ? & At = 25 \cdot 5 \pi & Pt = 10 \cdot 2 \cdot 5 \pi & F = 250\pi + 100\pi & V = 250\pi\sqrt{5} \text{ cm}^3 \\
 \text{-----} & At = 125 \pi \text{ cm}^2 & Pt = 100 \pi \text{ cm}^2 & F = 350\pi \text{ cm}^2 & &
 \end{array}$$

6.a) Számítsd ki a henger felszínét és térfogatát, ha síkmetszetének átlója pedig 26 cm, testmagassága pedig 24 cm



$$\begin{array}{l}
 H = 24 \text{ cm} \\
 D = 26 \text{ cm} \\
 F = ? V = ? At = ? Pt = ? r = ? \\
 \text{-----}
 \end{array}$$



$$\begin{array}{llll}
 D^2 = d^2 + H^2 & r = d : 2 & At = r^2 \pi & \\
 26^2 = d^2 + 24^2 & r = 10 : 2 & At = 5^2 \pi & \\
 676 = d^2 + 576 & r = 5 \text{ cm} & At = 25 \pi & \\
 d^2 = 676 - 576 & & At = 25 \pi \text{ cm}^2 & \\
 d^2 = 100 & & & \\
 d = \sqrt{100} & & & \\
 d = 10 \text{ cm} & & &
 \end{array}$$

$$\begin{array}{lll}
 Pt = 2\pi r H & F = 2At + Pt & V = At \cdot H \\
 Pt = 2 \cdot 5 \cdot \pi \cdot 24 & F = 2 \cdot 25\pi + 240\pi & V = 25\pi \cdot 24 \\
 Pt = 10\pi \cdot 24 & F = 50\pi + 240\pi & V = 600\pi \text{ cm}^3 \\
 Pt = 240\pi \text{ cm}^2 & F = 290\pi \text{ cm}^2 &
 \end{array}$$

6.b) A henger palástjának területe $192\pi \text{ cm}^2$. Számítsd ki a henger felszínét és térfogatát ha $H=8$ cm.



$$\begin{array}{llllll}
 H = 8 \text{ cm} & Pt = 2\pi r H & At = r^2 \pi & F = 2At + Pt & V = At \cdot H \\
 Pt = 192\pi \text{ cm}^2 & 192\pi = 2\pi r \cdot 8 \quad / : 2\pi & At = 12^2 \pi & F = 2 \cdot 144\pi + 192\pi & V = 144\pi \cdot 8 \\
 F = ? V = ? At = ? r = ? & 96 = 8r \quad / : 8 & At = 144\pi \text{ cm}^2 & F = 288\pi + 192\pi & V = 1152\pi \text{ cm}^3 \\
 \text{-----} & r = 12 \text{ cm} & & F = 480\pi \text{ cm}^2 &
 \end{array}$$

6.c) A henger felszíne $F = 70\pi \text{ cm}^2$. Számítsd ki a henger térfogatát ha $H=2 \text{ cm}$.

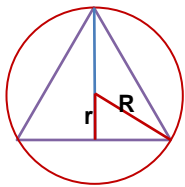


$$\begin{aligned} H &= 2 \text{ cm} \\ F &= 70\pi \text{ cm}^2 \\ V &= ? \quad At = ? \quad r = ? \\ \text{-----} \end{aligned}$$

$$\begin{aligned} F &= 2At + Pt \\ F &= 2 \cdot r^2\pi + 2 \cdot r \cdot \pi \cdot H \\ 70\pi &= 2 \cdot r^2\pi + 2 \cdot r \cdot \pi \cdot 2 \\ 70\pi &= 2 \cdot r\pi \cdot (r+2) \quad /2\pi \\ 35 &= r \cdot (r+2) \\ 35 &= 5 \cdot 7 \\ r &= 5 \text{ cm} \end{aligned}$$

$$\begin{aligned} At &= r^2\pi & V &= At \cdot H \\ At &= 5^2\pi & V &= 25\pi \cdot 2 \\ At &= 25\pi \text{ cm}^2 & V &= 50\pi \text{ cm}^3 \end{aligned}$$

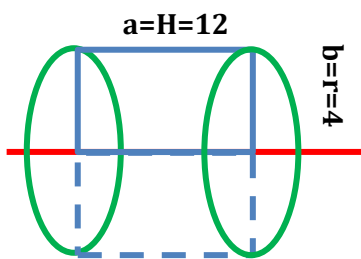
7.a) A henger alapja egy e.o. Δ (melynek oldala $a=24\sqrt{3} \text{ cm}$) köréírható köre. Számítsd ki a henger felszínét és térfogatát ha $H=6 \text{ cm}$.



$$\begin{aligned} a &= 24\sqrt{3} \text{ cm}, \\ H &= 6 \text{ cm} \\ F &= ? \quad V = ? \quad At = ? \quad Pt = ? \quad R = ? \\ \text{-----} \end{aligned}$$

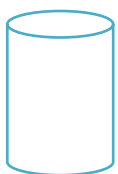
$$\begin{aligned} R &= \frac{a\sqrt{3}}{3} & At &= R^2\pi & Pt &= 2R \cdot \pi \cdot H & F &= 2At + Pt & V &= At \cdot H \\ R &= \frac{24\sqrt{3} \cdot \sqrt{3}}{3} & At &= 24^2\pi & Pt &= 48 \cdot \pi \cdot 6 & F &= 2 \cdot 576\pi + 288\pi & V &= 576\pi \cdot 6 \\ R &= 24 \text{ cm} & At &= 576\pi \text{ cm}^2 & Pt &= 288\pi \text{ cm}^2 & F &= 1152\pi + 288\pi & V &= 3456\pi \text{ cm}^3 \\ & & & & & & F &= 1440\pi \text{ cm}^2 & & \end{aligned}$$

7.b) Az $a=12 \text{ cm}$ és $b=4 \text{ cm}$ oldalú téglalap 360° -ban forog a hosszabb oldala körül. Számítsd ki az így kapott forgástest F



$$\begin{aligned} At &= r^2\pi & Pt &= 2r \cdot \pi \cdot H & F &= 2At + Pt \\ At &= 4^2\pi & Pt &= 8 \cdot \pi \cdot 12 & F &= 2 \cdot 16\pi + 96\pi \\ At &= 16\pi \text{ cm}^2 & Pt &= 96\pi \text{ cm}^2 & F &= 32\pi + 96\pi \\ & & & & F &= 128\pi \text{ cm}^2 \end{aligned}$$

7.c) Számítsd ki a henger térfogatát, ha sugarának és magasságának összege 5 cm , aránya pedig $2:8$



$$\begin{aligned} r + H &= 5 \text{ cm} \\ r : H &= 2 : 8 \\ V &= ? \quad At = ? \quad r = ? \quad H = ? \\ \text{-----} \end{aligned}$$

$$\begin{aligned} r : H &= 2 : 8 & r + H &= 5 \text{ cm} \\ 8 \cdot r &= 2 \cdot H & r + 4r &= 5 \\ H &= \frac{8 \cdot r}{2} & 5r &= 5 \\ H &= 4 \cdot r & r &= 5 : 5 \\ & & r &= 1 \text{ cm} \\ & & H &= 4 \text{ cm} \end{aligned}$$

$$\begin{aligned} At &= r^2\pi & V &= At \cdot H \\ At &= 1^2\pi & V &= 1\pi \cdot 4 \\ At &= 1\pi \text{ cm}^2 & V &= 4\pi \text{ cm}^3 \end{aligned}$$