

**POZOR:** Vse naloge, ki so označene z , so težje naloge jih rešujete, če želite.

**Vaja dela mojstra**



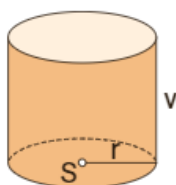
$$2r = v$$

1. Izračunaj površino in prostornino **enakostraničnega valja:**

a)  $r = 3,2 \text{ cm}$

$P = ?$

$V = ?$



$$v = 2r = 6,4 \text{ cm}$$

$$O = \pi \cdot r^2 = \pi \cdot 3,2^2 = 10,24 \pi \text{ cm}^2$$

$$pl = 2\pi \cdot r \cdot v = 2\pi \cdot 3,2 \cdot 6,4 = 40,96\pi \text{ cm}^2$$

$$P = 2 \cdot O + pl = 2 \cdot 10,24\pi + 40,96\pi = 61,44 \pi \text{ cm}^2$$

$$V = O \cdot v = 10,24\pi \cdot 6,4 = 65,536 \pi \text{ cm}^3$$

b)  $2r = 18 \text{ cm}$

$P = ?$

$V = ?$

Skica

$$2r = v = 18 \text{ cm}, \quad r = 9 \text{ cm}$$

$$O = \pi \cdot r^2 = \pi \cdot 9^2 = 81 \pi \text{ cm}^2$$

$$pl = 2\pi \cdot r \cdot v = 2\pi \cdot 9 \cdot 18 = 324 \pi \text{ cm}^2$$

$$P = 2 \cdot O + pl = 2 \cdot 81\pi + 324\pi = 486 \pi \text{ cm}^2$$

$$V = O \cdot v = 81\pi \cdot 18 = 1458 \pi \text{ cm}^3$$

c)  $v = 42 \text{ cm}$

$P = ?$

$V = ?$

Skica

$$v = 2r = 42 \text{ cm}, \quad r = 21 \text{ cm}$$

$$O = \pi \cdot r^2 = \pi \cdot 21^2 = 441 \pi \text{ cm}^2$$

$$pl = 2\pi \cdot r \cdot v = 2\pi \cdot 21 \cdot 42 = 1764 \pi \text{ cm}^2$$

$$P = 2 \cdot O + pl = 2 \cdot 441\pi + 1764\pi = 2646 \pi \text{ cm}^2$$

$$V = O \cdot v = 441\pi \cdot 42 = 18522 \pi \text{ cm}^3$$



č)  $o = 182 \text{ cm}$   $\longrightarrow$  To pomeni obseg osnovne ploskve, torej obseg kroga.

$P = ?$

$$o = 2\pi r = 182 \rightarrow r = 182 : 2\pi = 29 \text{ cm}$$

$V = ?$

$$v = 2r = 58 \text{ cm}$$

Skica

$$O = \pi \cdot r^2 = \pi \cdot 29^2 = 841 \pi \text{ cm}^2$$

$$pl = 2\pi \cdot r \cdot v = 2\pi \cdot 29 \cdot 58 = 3364 \pi \text{ cm}^2$$

$$P = 2 \cdot O + pl = 2 \cdot 841\pi + 3364\pi = 5046 \pi \text{ cm}^2$$

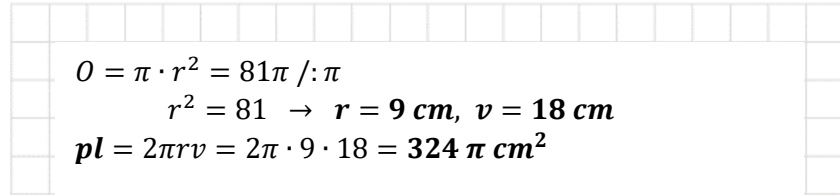
$$V = O \cdot v = 841\pi \cdot 58 = 48778 \pi \text{ cm}^3$$

d)  $O = 81\pi \text{ cm}^2$

$P = ?$

$V = ?$

Skica



$$O = \pi \cdot r^2 = 81\pi /: \pi$$

$$r^2 = 81 \rightarrow r = 9 \text{ cm}, v = 18 \text{ cm}$$

$$pl = 2\pi r v = 2\pi \cdot 9 \cdot 18 = 324 \pi \text{ cm}^2$$

$$P = 2 \cdot O + pl = 2 \cdot 81\pi + 324\pi = 486 \pi \text{ cm}^2$$

$$V = O \cdot v = 81\pi \cdot 18 = 1458 \pi \text{ cm}^3$$

2. Plašč enakostraničnega valja je pravokotnik z višino 16 cm. Izračunaj površino in prostornino valja.

Ker je  $v = 2r = 16 \text{ cm}$ , je  $r = 8 \text{ cm}$ .

$$O = \pi \cdot r^2 = \pi \cdot 8^2 = 64 \pi \text{ cm}^2$$

$$pl = 2\pi \cdot r \cdot v = 2\pi \cdot 8 \cdot 16 = 256 \pi \text{ cm}^2$$

$$P = 2 \cdot O + pl = 2 \cdot 64\pi + 256 \pi = 384 \pi \text{ cm}^2$$

$$V = O \cdot v = 64\pi \cdot 16 = 1024 \pi \text{ cm}^3$$

- ★ 3. Površina enakostraničnega valja je  $796 \text{ cm}^2$ . Koliko meri njegova prostornina?

Reševanje:

Če zapišemo formulo za površino enakostraničnega stožca in upoštevamo, da je  $v = 2r$ , dobimo:

$$P = 2 \cdot \pi r^2 + 2\pi r \cdot v = 2\pi r^2 + 4\pi r^2 = 6\pi r^2$$

$$v = 2r$$

POVRŠINA ENAKOSTRANIČNEGA STOŽCA JE:

$$P = 6\pi r^2$$

$$P = 6\pi r^2 = 796 \text{ } /: 6\pi$$

$$r^2 = 42,25 \rightarrow r = 6,5 \text{ cm}, v = 13 \text{ cm}$$

$$O = \pi r^2 = \pi \cdot 6,5^2 = 42,25 \pi \text{ cm}^2$$

$$V = O \cdot v = 42,25\pi \cdot 13 = 549,25\pi = 1724,6 \text{ cm}^3$$

- ★ 4. Prostornina enakostraničnega valja meri  $16\pi \text{ cm}^3$ . Koliko meri njegova površina?

Reševanje:

$$v = 2r$$

$$V = O \cdot v = \pi r^2 \cdot v = \pi \cdot r^2 \cdot 2r = 2\pi \cdot r^3 = 16\pi \text{ } /: 2\pi$$

$$r^3 = 8 \rightarrow r = 2 \text{ cm in } v = 4 \text{ cm}$$

$$O = \pi \cdot r^2 = \pi \cdot 4 = 4\pi \text{ cm}^2$$

$$pl = 2\pi r \cdot v = 2\pi \cdot 2 \cdot 4 = 16\pi \text{ cm}^2$$

$$P = 2 \cdot O + pl = 2 \cdot 4\pi + 16\pi = 24\pi \text{ cm}^2$$

5. Plašč enakostraničnega valja razgrnemo v ravnino in dobimo pravokotnik s širino 14 cm. Izračunaj površino in prostornino valja. ( ~~$\pi \cdot \frac{22}{7}$~~ )

Ker je širina pravokotnika enaka višini valja, je  $v = 14 \text{ cm}$  in je  $r = 7 \text{ cm}$ .

$$O = \pi \cdot r^2 = \pi \cdot 7^2 = 49\pi \text{ cm}^2$$

$$pl = 2\pi \cdot r \cdot v = 2\pi \cdot 7 \cdot 14 = 196\pi \text{ cm}^2$$

$$P = 2 \cdot O + pl = 2 \cdot 49\pi + 196\pi = 294\pi \text{ cm}^2$$

$$V = O \cdot v = 49\pi \cdot 14 = 686\pi \text{ cm}^3$$

- ★ 6. Enakostranični valj ima ploščino plašča  $1296\pi \text{ cm}^2$ . Koliko meri njegova površina in koliko prostornina?

Reševanje:

$$pl = 2\pi r \cdot v = 4\pi \cdot r^2 = 1296\pi /: 4\pi$$

$$\textcircled{v = 2r} \quad r^2 = 324 \rightarrow r = 18 \text{ cm}, \quad v = 36 \text{ cm}$$

$$O = \pi r^2 = 324\pi \text{ cm}^2$$

$$P = 2O + pl = 2 \cdot 324\pi + 1296\pi = 1944\pi \text{ cm}^2$$

$$V = O \cdot v = 324\pi \cdot 36 = 11664\pi \text{ cm}^3$$