

9.r - UTRJEVANJE ZNANJA (prizma, pravilna 4-strana piramida) – 7. teden

Legenda: *minimalni standard znanja

**temeljni standard znanja

***zahtevnejši standard znanja

1.* Izračunaj neznane količine.

a) KOCKA

$$O = 16 \text{ dm}^2$$

$$P = ?$$

$$V = ?$$

b) KOCKA

$$pl = 36 \text{ m}^2$$

$$P = ?$$

$$V = ?$$

c) KVADER

$$a = 2 \text{ cm}$$

$$b = 4 \text{ cm}$$

$$pl = 72 \text{ cm}^2$$

$$P = ?$$

$$V = ?$$

d) KVADER

$$a = 4 \text{ cm}$$

$$v = 8 \text{ cm}$$

$$O = 20 \text{ cm}^2$$

$$P = ?$$

$$V = ?$$

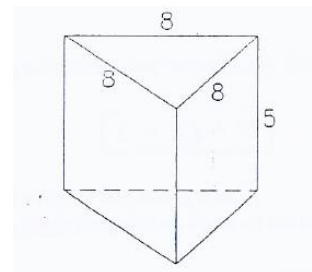
$\begin{aligned} O &= 16 \text{ dm}^2 \\ P &=? \\ V &=? \end{aligned}$	$\begin{aligned} P &= 6 \cdot \varphi \\ P &= 6 \cdot 16 \\ P &= 96 \text{ dm}^2 \end{aligned}$	$\begin{aligned} V &= \varphi \cdot \pi \\ V &= 16 \cdot 4 \\ V &= 64 \text{ dm}^3 \end{aligned}$	$\begin{aligned} a &= \varphi \\ \varphi &= 16 \\ a^2 &= 16 \\ a &= 4 \text{ dm} \end{aligned}$
------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------

$\begin{aligned} pl &= 36 \text{ cm}^2 \\ P &= \\ V &= \end{aligned}$	$\begin{aligned} P &= 6a^2 \\ P &= 6 \cdot 3^2 \\ P &= 6 \cdot 9 \\ P &= 54 \text{ cm}^2 \end{aligned}$	$\begin{aligned} V &= a^3 \\ V &= 3^3 \\ V &= 27 \text{ cm}^3 \end{aligned}$	$\begin{aligned} pl &= 4a^2 \\ 4a^2 &= 36 \quad :4 \\ a^2 &= 9 \\ a &= 3 \text{ cm} \end{aligned}$
-----------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------

$\begin{aligned} O &= 20 \text{ cm}^2 \\ a &= 4 \text{ cm} \\ v &= 8 \text{ cm} \\ P &= \\ V &= \end{aligned}$	$\begin{aligned} P &= 2 \cdot O + pl \\ P &= 2 \cdot 20 + 2(4 \cdot 5) \cdot 8 \\ P &= 40 + 320 \\ P &= 360 \text{ cm}^2 \end{aligned}$	$\begin{aligned} O &= a \cdot b \\ 20 &= 4 \cdot b \\ b &= 20 : 4 \\ b &= 5 \text{ cm} \end{aligned}$	$\begin{aligned} V &= O \cdot v \\ V &= 20 \cdot 8 \\ V &= 160 \text{ cm}^3 \end{aligned}$
----------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------

$\begin{aligned} a &= 4 \text{ cm} \\ b &= 2 \text{ cm} \\ pl &= 72 \text{ cm}^2 \\ P &= \\ V &= \end{aligned}$	$\begin{aligned} P &= 2 \cdot O + pl \\ P &= 2 \cdot ab + pl \\ P &= 2 \cdot 4 \cdot 2 + 72 \\ P &= 16 + 72 \\ P &= 88 \text{ cm}^2 \end{aligned}$	$\begin{aligned} V &= O \cdot v \\ V &= ab \cdot v \\ V &= 4 \cdot 2 \cdot 6 \\ V &= 48 \text{ cm}^3 \end{aligned}$	$\begin{aligned} pl &= O \cdot v \\ pl &= 2(a+b) \cdot v \\ 72 &= 2(4+2) \cdot v \\ 72 &= 12 \cdot v \\ v &= 72 : 12 \\ v &= 6 \text{ cm} \end{aligned}$
-----------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------

2.* Izračunaj površino in prostornino narisane prizme (mere so v cm).



pravilna 3-strana prizma
 $a = 8 \text{ cm}$
 $n = 5 \text{ cm}$

$P = ?$
 $V = ?$

ALI

$$P = 2 \cdot \frac{a^2 \sqrt{3}}{4 \cdot 2} + 3an$$

$$P = \frac{32 \sqrt{3}}{2 \cdot 1} + 3 \cdot 8 \cdot 5$$

$$P = (32\sqrt{3} + 120) \text{ cm}^2$$

$$P = 32 \cdot 1,73 + 120$$

$$P = 175,36 \text{ cm}^2$$

$$V = \frac{a^2 \sqrt{3}}{4} \cdot n$$

$$V = \frac{16 \cdot 8^2 \sqrt{3}}{4 \cdot 1} \cdot 5$$

$$V = 80\sqrt{3} \text{ cm}^3$$

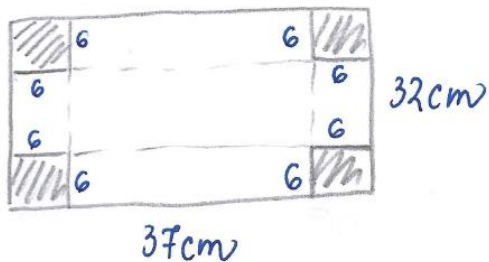
3.* Kocka in kvader imata enaki površini. Kolikšna je prostornina kocke, če robovi kvadra merijo 15 cm, 27 cm in 35 cm? Katero telo ima večjo prostornino in za koliko?

KOCKA	KVADER		
$P_k = P_{kv}$	$a = 15 \text{ cm}$	$P_{kv} = 2 \cdot (ab + ac + bc)$	$P_k = 3750 \text{ cm}^2$
$V_k =$	$b = 27 \text{ cm}$	$P_{kv} = 2 \cdot (15 \cdot 27 + 15 \cdot 35 + 27 \cdot 35)$	$P_k = 6a^2$
	$c = 35 \text{ cm}$	$P_{kv} = 2 \cdot (405 + 525 + 945)$	$3750 = 6a^2$
	$V_{kv} =$	$P_{kv} = 2 \cdot 1875$	$a^2 = 3750 : 6$
		$P_{kv} = 3750 \text{ cm}^2$	$a^2 = 625$
		$V_k = a^3$	$a = \sqrt{625}$
		$V_k = 25^3$	$a = 25 \text{ cm}$
		$V_k = 15625 \text{ cm}^3$	
		$V_{kv} = a \cdot b \cdot c$	$V_k - V_{kv}$
		$V_{kv} = 15 \cdot 27 \cdot 35$	$= 15625 \text{ cm}^3 - 14175 \text{ cm}^3 =$
		$V_{kv} = 14175 \text{ cm}^3$	$= 1450 \text{ cm}^3$

Odg.: Večjo prostornino ima kocka, za 1450 cm^3 .

4.** Iz kartona, ki je dolg 37 cm in širok 32 cm, naredimo škatlo tako, da na vogalih izrežemo kvadrate s stranico 6 cm. Kolikšna je prostornina te škatle? Nariši si sliko!

∴ KARTON - pravokotne oblike



$$V = a \cdot b \cdot c$$

$$V = 25 \cdot 20 \cdot 6$$

$$V = 3000 \text{ cm}^3 = 3 \text{ dm}^3$$

$$V =$$

$$a = 25 \text{ cm}$$

$$b = 20 \text{ cm}$$

$$c = 6 \text{ cm}$$

$$a = 37 - 12$$

$$a = 25 \text{ cm}$$

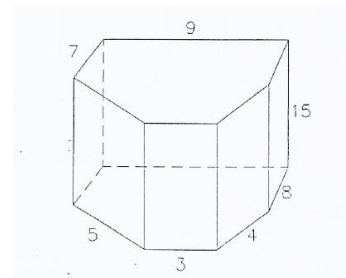
$$b = 32 - 12$$

$$b = 20 \text{ cm}$$

$$c = 6 \text{ cm}$$

Odg.: Prostornina škatle je 3 dm^3 .

5.** Izračunaj plač pokončne prizme na sliki (mere so v cm).



6-strana prizma

$$a = 9 \text{ cm}$$

$$b = 7 \text{ cm}$$

$$c = 5 \text{ cm}$$

$$d = 3 \text{ cm}$$

$$e = 4 \text{ cm}$$

$$f = 8 \text{ cm}$$

$$r = 15 \text{ cm}$$

$$pl = ?$$

$$pl = (a + b + c + d + e + f) \cdot r$$

$$pl = (9 + 7 + 5 + 3 + 4 + 8) \cdot 15$$

$$pl = 36 \cdot 15$$

$$pl = 540 \text{ cm}^2$$

6.** Površina pravilne 4-strane prizme meri 420 cm^2 . Izračunaj njeno višino, če meri osnovni rob 5 cm .

pravilna 4-strana prizma

$$P = 2 \cdot \psi + pl$$

$$P = 2 \cdot a^2 + 4a \cdot v \quad | -2a^2$$

$$4a \cdot v = P - 2a^2$$

$$v = \frac{P - 2a^2}{4a}$$

$$v = \frac{420 - 2 \cdot 5^2}{4 \cdot 5}$$

$$v = \frac{420 - 2 \cdot 25}{20}$$

$$v = \frac{420 - 50}{20}$$

$$v = \frac{370}{20}$$

$$v = \underline{\underline{18,5 \text{ cm}}}$$

$P = 420 \text{ cm}^2$
 $a = 5 \text{ cm}$
 $v = ?$

7.*** Osnovna ploskev 12 cm visoke pokončne tristrane prizme je pravokotni trikotnik, katerega vsota katet je 46 cm . Izračunaj plašč te prizme, če sta kateti v razmerju $15:8$.

3-strana prizma
(ψ -pravokotni Δ)

$$v = 12 \text{ cm}$$

$$k_1 + k_2 = 46 \text{ cm}$$

$$k_1 : k_2 = 15 : 8$$

$k_1 = 15t$
 $k_2 = 8t$
 $k_1 + k_2 = 46$
 $15t + 8t = 46$
 $23t = 46 \quad | :23$
 $t = 2$

$k_1 = 15 \cdot 2 = 30 \text{ cm}$
 $k_2 = 8 \cdot 2 = 16 \text{ cm}$

$pl = (k_1 + k_2 + h) \cdot v$
 $pl = (30 + 16 + 34) \cdot 12$
 $pl = 80 \cdot 12$
 $pl = \underline{\underline{960 \text{ cm}^2}}$

$h^2 = k_1^2 + k_2^2$
 $h = \sqrt{30^2 + 16^2}$
 $h = \sqrt{900 + 256}$
 $h = \underline{\underline{34 \text{ cm}}}$

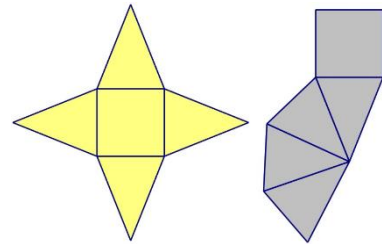
Spodnjo nalogo (#8) reši in fotografiraj. Sliko vstavi v Wordov dokument, zapiši **datum**, **naslov** in **avtorja**. Dokument shrani v PDF formatu in ga kot prilogo pošlji po e-pošti učiteljici matematike. Dokument poimenuj MAT_Ime_Priimek_7t.

Zadolžitev oddaj do **srede, 6. 5. 2020.**

8.* Iz tršega papirja izdelaj mrežo pravilne 4-strane piramide, če osnovni rob meri 5 cm in višina stranske ploskve 7 cm. Mrežo zlepi tako, da jo boš lahko napolnil z rižem.



Razmisli. Katera mreža je primernejša za izvedbo te naloge?



- Koliko papirja si porabil za izdelavo mreže?
- Koliko prostora zavzame notranjost izdelane piramide?
- Napolni model z rižem.

Koliko gramov riža si potreboval, da si napolnil model pravilne 4-strane piramide do vrha?



- Koliko gramov riža bi potreboval, da bi napolnil model pravilne 4-strane prizme, z enako osnovno ploskvijo in enako višino?
- **Približno koliko meri višina teh dveh teles?