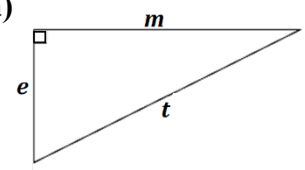
Priprema za 1. kratku pisanu provjeru

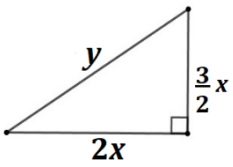
– primjena Pitagorina poučka na pravokutni trokut, pravokutnik i kvadrat –

1) Za trokut napiši formulu Pitagorinog poučka:

a)

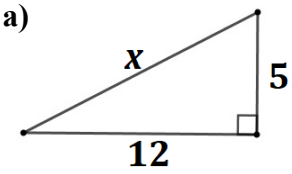


b)

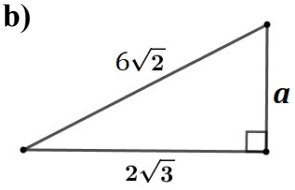


2) Izračunaj duljinu nepoznate stranice:

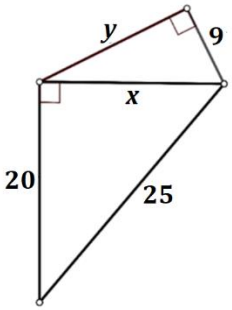
a)



b)



3) Izračunaj duljine x i y nepoznatih stranica:



4) Izračunaj opseg pravokutnog trokuta ako je zadana površina trokuta $P = 120\ cm^2$ i duljina jedne njegove katete $a = 24\ cm$.

5) Izračunaj **površinu** pravokutnog trokuta kojemu se jedna kateta prema hipotenuzi odnosi u omjeru 1 : 3, a duljina druge katete je $2\sqrt{6}\ cm$.

6) Zadan je pravokutnik sa stranicama duljine a i b i dijagonalom duljine d. Odredi nepoznati element.

a) $a = 16\ cm$, $b = 12\ cm$

b) $d = 3\sqrt{6}\ mm$, $b = 3\ mm$

c) $a = 2\sqrt{3}\ cm$, $d = 2\sqrt{6}\ cm$

7) Izračunaj duljinu **dijagonale** pravokutnika ako su mu duljine stranica $2\sqrt{3}\ cm$ i $2\sqrt{6}\ cm$.

8) Izračunaj duljinu **dijagonale** pravokutnika površine $6\sqrt{2}\ dm^2$ i duljine jedne stranice $2\sqrt{6}\ dm$.

9) Izračunaj duljinu **dijagonale** kvadrata kojemu je duljina stranice:

a) $a = 3\ dm$ **b)** $a = \sqrt{18}\ cm$ **c)** $a = 6\sqrt{2}\ cm$

10) Izračunaj duljinu **stranice** kvadrata kojemu je dijagonala duljine:

a) $d = 8\sqrt{2}\ cm$ **b)** $d = \sqrt{90}\ dm$ **c)** $d = 20\ cm$

11) Odredi **duljinu stranice** kvadrata ako mu je dijagonala duljine $5\sqrt{6}\ cm$.

12) Površina kvadratu opisanog kruga iznosi $8\pi\ cm^2$.
Izračunaj **površinu kvadrata**.

13) Izračunaj **duljinu dijagonale** i **površinu** kvadrata opsega $24\sqrt{3}\ cm$.

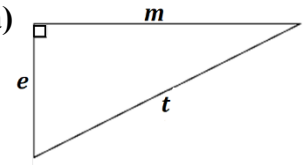
14) Izračunaj **opseg** i **površinu upisanog kruga** kvadratu kojemu je duljina dijagonale 18 *mm*.

Priprema za 1. kratku pisanu provjeru

– rješenja –

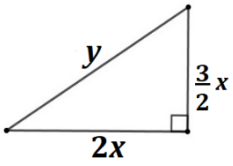
1) Za trokut napiši formulu Pitagorinog poučka:

a)



$\boxed{t^2 = e^2 + m^2}$

b)



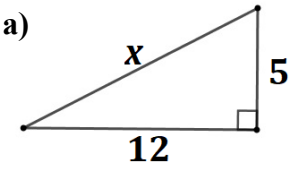
$y^2 = (2x)^2 + \left(\frac{3}{2}x\right)^2$

$y^2 = 4x^2 + \frac{9}{4}x^2$

$\boxed{y^2 = \frac{25}{4}x^2}$

2) Izračunaj duljinu nepoznate stranice:

a)



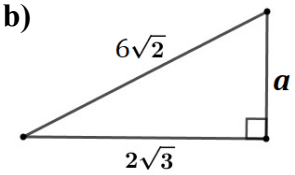
$x^2 = 5^2 + 12^2$

$x^2 25 + 144$

$x^2 = 169 \quad /\sqrt{\ }$

$\boxed{x = 13}$

b)



$a^2 = \left(6\sqrt{2}\right)^2 - \left(2\sqrt{3}\right)^2$

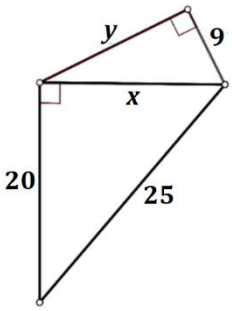
$a^2 = 36 \cdot 2 - 4 \cdot 3$

$a^2 = 60 \quad /\sqrt{\ }$

$a = \sqrt{4 \cdot 15}$

$\boxed{a = 2\sqrt{15}}$

3) Izračunaj duljine x i y nepoznatih stranica:



$x^2 = 25^2 - 20^2$

$x^2 = 625 - 400$

$x^2 = 225 \quad /\sqrt{\ }$

$\boxed{x = 15}$

$y^2 = 15^2 - 9^2$

$y^2 = 225 - 81$

$y^2 = 144 \quad /\sqrt{\ }$

$\boxed{y = 12}$

4) Izračunaj opseg pravokutnog trokuta ako je zadana površina trokuta $P = 120\ cm^2$ i duljina jedne njegove katete $a = 24\ cm$.

$P = 120\ cm^2$

$a = 24\ cm$

$o = ?$

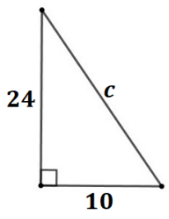
676	2
338	2
169	13
13	13
1	

$P = 120$

$\frac{24 \cdot b}{2} = 120$

$12b = 120 \quad / : 12$

$\boxed{b = 10\ cm}$



$c^2 = 24^2 + 10^2$

$c^2 = 576 + 100$

$c^2 = 676 \quad /\sqrt{\ }$

$\boxed{c = 26\ cm}$

$o = a + b + c$

$o = 24 + 10 + 26$

$\boxed{o = 60\ cm}$

5) Izračunaj **površinu** pravokutnog trokuta kojemu se jedna kateta prema hipotenuzi odnosi u omjeru 1 : 3, a duljina druge katete je $2\sqrt{6}\ cm$.

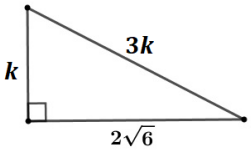
$a : c = 1 : 3 \quad \Rightarrow$

$b = 2\sqrt{6}\ cm$

$P = ?$

$\boxed{a = k = \sqrt{3}}$

$\boxed{c = 3k = 3\sqrt{3}}$



$(3k)^2 - k^2 = \left(2\sqrt{6}\right)^2$

$9k^2 - k^2 = 4 \cdot 6$

$8k^2 = 24 \quad / : 8$

$k^2 = 3 \quad /\sqrt{\ }$

$\boxed{k = \sqrt{3}}$

$P = \frac{\sqrt{3} \cdot 2\sqrt{6}}{2}$

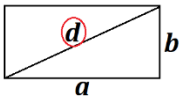
$P = \sqrt{18}$

$P = \sqrt{9 \cdot 2}$

$\boxed{P = 3\sqrt{2}cm^2}$

6) Zadan je pravokutnik sa stranicama duljine a i b i dijagonalom duljine d. Odredi nepoznati element.

a) $a = 16\ cm$, $\underline{b = 12\ cm}$, $d = ?$ (hipotenuza)



$d^2 = a^2 + b^2$

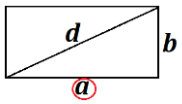
$d^2 = 16^2 + 12^2$

$d^2 = 256 + 144$

$d^2 = 400 \ / \sqrt{\ }$

$\boxed{d = 20\ cm}$

b) $d = 3\sqrt{6}\ mm$, $\underline{b = 3\ mm}$, $a = ?$ (kateta)



$a^2 = d^2 - b^2$

$a^2 = (3\sqrt{6})^2 - 3^2$

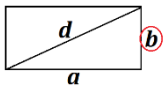
$a^2 = 54 - 9$

$a^2 = 45 \ / \sqrt{\ }$

$a = \sqrt{9 \cdot 5}$

$\boxed{a = 3\sqrt{5}\ mm}$

c) $a = 2\sqrt{3}\ cm$, $\underline{d = 2\sqrt{6}\ cm}$, $b = ?$ (kateta)



$b^2 = d^2 - a^2$

$b^2 = (2\sqrt{6})^2 - (2\sqrt{3})^2$

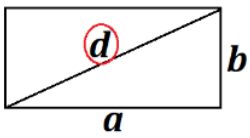
$b^2 = 24 - 4 \cdot 3$

$b^2 = 12 \ / \sqrt{\ }$

$b = \sqrt{4 \cdot 3}$

$\boxed{b = 2\sqrt{3}\ cm}$

7) Izračunaj duljinu **dijagonale** pravokutnika ako su mu duljine stranica $2\sqrt{3}\ cm$ i $2\sqrt{6}\ cm$.



$a = 2\sqrt{3}\ cm$

$\underline{b = 3\sqrt{5}\ cm}$

$d = ?$

$d^2 = (2\sqrt{3})^2 + (2\sqrt{6})^2$

$d^2 = 4 \cdot 3 + 4 \cdot 6$

$d^2 = 36 \ / \sqrt{\ }$

$\boxed{d = 6\ cm}$

8) Izračunaj duljinu **dijagonale** pravokutnika površine $6\sqrt{2}\ dm^2$ i duljine jedne stranice $2\sqrt{6}\ dm$.

$P = 6\sqrt{2}\ dm^2$

$\underline{a = 2\sqrt{6}\ dm}$

$d = ?$

$P = 6\sqrt{2}$

$a \cdot b = 6\sqrt{2}$

$2\sqrt{6} \cdot b = 6\sqrt{2} \quad / : 2\sqrt{6}$

$b = \frac{3\sqrt{2}}{\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}}$

$b = \frac{3\sqrt{12}}{6}$

$b = \frac{\sqrt{4 \cdot 3}}{2}$

$b = \frac{2\sqrt{3}}{2}$

$\boxed{b = \sqrt{3}\ dm}$

$d^2 = (2\sqrt{6})^2 + (\sqrt{3})^2$

$d^2 = 4 \cdot 6 + 3$

$d^2 = 27 \quad / \sqrt{\ }$

$d = \sqrt{27}$

$d = \sqrt{9 \cdot 3}$

$\boxed{d = 3\sqrt{3}\ cm}$

9) Izračunaj duljinu **dijagonale** kvadrata kojemu je duljina stranice:

a) $\underline{a = 3\ dm}$, $d = ?$

$d = a\sqrt{2}$

$\boxed{d = 3\sqrt{2}\ dm}$

b) $\underline{a = \sqrt{18}\ cm}$, $d = ?$

$d = a\sqrt{2}$

$d = \sqrt{18} \cdot \sqrt{2}$

$d = \sqrt{36}$

$\boxed{d = 6\ cm}$

c) $\underline{a = 6\sqrt{2}\ cm}$, $d = ?$

$d = a\sqrt{2}$

$d = 6\sqrt{2} \cdot \sqrt{2}$

$d = 6 \cdot 2$

$\boxed{d = 12\ cm}$

10) Izračunaj duljinu **stranice** kvadrata kojemu je dijagonala duljine:

a) $\underline{d = 8\sqrt{2}\ cm}$
$a = ?$

$d = 8\sqrt{2}$
$a\sqrt{2} = 8\sqrt{2} \quad / : \sqrt{2}$
$\boxed{a = 8\ cm}$

b) $\underline{d = \sqrt{90}\ dm}$
$a = ?$

$d = \sqrt{90}$
$a\sqrt{2} = \sqrt{90} \quad / : \sqrt{2}$
$a = \sqrt{45}$
$a = \sqrt{9 \cdot 5}$
$\boxed{a = 3\sqrt{5}\ cm}$

c) $\underline{d = 20\ cm}$
$a = ?$

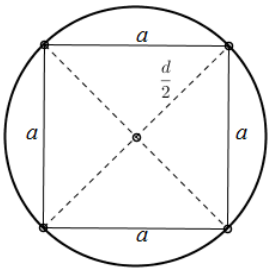
$d = 20$
$a\sqrt{2} = 20 \quad / : \sqrt{2}$
$a = \frac{20}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$
$a = \frac{20\sqrt{2}}{2}$
$\boxed{a = 10\sqrt{2}\ cm}$

11) Odredi **duljinu stranice** kvadrata ako mu je dijagonala duljine $5\sqrt{6}\ cm$.

$\underline{d = 5\sqrt{6}\ cm}$
$a = ?$

$d = 5\sqrt{6}$
$a\sqrt{2} = 5\sqrt{6} \quad / : \sqrt{2}$
$\boxed{a = 5\sqrt{3}\ cm}$

12) Površina kvadratu <u>opisanog kruga</u> iznosi $8\pi\ cm^2$.
Izračunaj **površinu kvadrata**.



$\underline{P_o = 8\pi\ cm^2}$
$P = ?$

$P_o = 8\pi$
$r^2\pi = 8\pi \quad / : \pi$
$r^2 = 8 \quad / \sqrt{\ }$
$r = \sqrt{4 \cdot 2}$
$\boxed{r = 2\sqrt{2}} \Rightarrow \boxed{d = 4\sqrt{2}}$

$d = 4\sqrt{2}$
$a\sqrt{2} = 4\sqrt{2} \quad / : \sqrt{2}$
$\boxed{a = 4\ cm}$

$P = a^2$
$P = 4^2$
$\boxed{P = 16\ cm^2}$

13) Izračunaj **duljinu dijagonale** i **površinu** kvadrata opsega $24\sqrt{3}\ cm$.

$\underline{o = 24\sqrt{3}\ cm}$
$d = ?$

$o = 24\sqrt{3}$
$4a = 24\sqrt{3} \quad / : 4$
$\boxed{a = 6\sqrt{3}\ cm}$

$d = a\sqrt{2}$
$d = 6\sqrt{3} \cdot \sqrt{2}$
$\boxed{d = 6\sqrt{6}\ cm}$

$P = a^2$
$P = (6\sqrt{3})^2$
$\boxed{P = 108\ cm^2}$

14) Izračunaj **opseg** i **površinu upisanog kruga** kvadratu kojemu je duljina dijagonale 18 *mm*.

Kvadrat:

$d = 18\ mm$
$a = ?$

$d = 18$

$a\sqrt{2} = 18 \quad / : \sqrt{2}$

$a = \frac{18}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$a = \frac{18\sqrt{2}}{2}$

$\boxed{a = 9\sqrt{2}\ mm}$

Upisani krug:

$r = \frac{a}{2}$

$\boxed{r = \frac{9\sqrt{2}}{2}\ mm}$

$o = 2r\pi$

$o = 2 \cdot \frac{9\sqrt{2}}{2}\pi$

$\boxed{o = 9\sqrt{2}\pi\ mm}$

$P = r^2\pi$

$P = \left(\frac{9\sqrt{2}}{2}\right)^2 \pi$

$P = \frac{81 \cdot 2}{4}\pi$

$\boxed{P = \frac{81}{2}\pi\ mm^2}$