Řasní - Didaktický test č. 5 - Didaktis 2020

1) $85\boxed{8}6 \rightarrow 8+5+8+6 = 24 \rightarrow$ ciferný součet musí být dělitelný 9
$24 : 9 = 3(0)$

2) a) $\dfrac{\sqrt{10^2-8^2}}{\sqrt{10^2-8^2}} = \dfrac{10-64}{\sqrt{100-64}} = \dfrac{-54}{6} = \boxed{-9}$
($\sqrt{100-64} = 36$)

b) $\sqrt{1^2+0{,}8^2-0{,}4^2-0{,}2^2} = \sqrt{1+0{,}64-0{,}16-0{,}04} = \sqrt{1{,}44} = \boxed{1{,}2}$

3) a) $\dfrac{4{,}9 : 49 + 0{,}5^2}{-0{,}4} = \dfrac{0{,}1+0{,}25}{-0{,}4} = \dfrac{0{,}35}{-0{,}4} = -\dfrac{35}{40} = \boxed{-\dfrac{7}{8}}$

b) $\dfrac{\frac{3}{10} - 1\frac{1}{2}\cdot\frac{1}{6}}{\frac{2}{5} : \left(-1\frac{1}{3}\right)} = \dfrac{\frac{3}{10} - \frac{3}{2}\cdot\frac{1}{6_2}}{\frac{2}{5} : \left(-\frac{4}{3}\right)} = \dfrac{\frac{3}{10} - \frac{1}{4}}{-\frac{2}{5}\cdot\frac{3}{4_2}} = \dfrac{\frac{6-5}{20}}{-\frac{3}{10}} = \dfrac{1}{20}\cdot\left(-\dfrac{10}{3}\right) = \boxed{-\dfrac{1}{6}}$

4) a) $(2e+4d)^2 = \boxed{4e^2 + 16ed + 16d^2}$

b) $(m-3)(m+3) - (1-m^2) = m^2 - 9 - 1 + m^2 = \boxed{2m^2 - 10}$

c) $2(m+4)^2 - (m-2)\cdot 2m = 2(m^2+8m+16) - 2m^2 + 4m = 2m^2 + 16m + 32 - 2m^2 + 4m =$
$= \boxed{20m + 32}$

5) a) $5(2-x) - [x + 6(2x+11)] = -2$
$10 - 5x - (x + 12x + 66) = -2$
$10 - 5x - x - 12x - 66 = -2$
$-18x = 54$
$\boxed{x = -3}$

b) $\dfrac{1-2x-x}{2} + \dfrac{3x+11}{8} = 1 - \dfrac{1}{4}(5x-3)$
$\dfrac{1-3x}{2} + \dfrac{3x+11}{8} = 1 - \dfrac{5x-3}{4} \quad /\cdot 8$
$4 - 12x + 3x + 11 = 8 - 10x + 6$
$-9x + 15 = 14 - 10x$
$\boxed{x = -1}$

6) 6.1. $0{,}5h \ldots 40\%$ trasy $(0{,}4x)$
$\frac{2}{3}h \ldots \frac{1}{3} \doteq 60\% = 20\% = 0{,}2x$
} zbývá ujít $1 - 0{,}4x - 0{,}2x = 0{,}4x = \frac{4}{10}x = \boxed{\frac{2}{5}x}$

6.2. $0{,}5h + \underbrace{3\cdot\frac{2}{3}h}_{3\cdot 20\%} = 0{,}5h + 2h = \boxed{2{,}5h}$
($0{,}5h = 40\%$)

6.3. 20% trasy trvá ujít $\frac{2}{3}h = 40$ minut
100% trasy - " - $5\cdot\frac{2}{3}h = 5\cdot 40$ minut $= \boxed{200 \text{ minut}}$

7) 1) $S_{\square} = 144\,cm^2 \Rightarrow |BG| = |GH| = \underline{12cm}$

$|DB|^2 = |CD|^2 - |BC|^2$

2) $|DB|^2 = 13^2 - 12^2 = 169 - 144 = 25 \Rightarrow \underline{|DB| = 5cm}$

7.1. $|AB| = 2 \cdot |DB| = 2 \cdot 5 = \boxed{10cm}$

7.2. $S_{\triangle ADC} = \frac{|AD| \cdot |BC|}{2} = \frac{5 \cdot 12}{2}\,cm^2 = \boxed{30cm^2}$

8) Lichoběžník: $S = 24cm^2$, $c = 3cm$, $r = 6cm$, $a = 2$

$S = \frac{(a+c)r}{2}$

$2S = ar + cr$

$a = \frac{2S - cr}{r} = \frac{48 - 18}{6} = \boxed{5cm}$

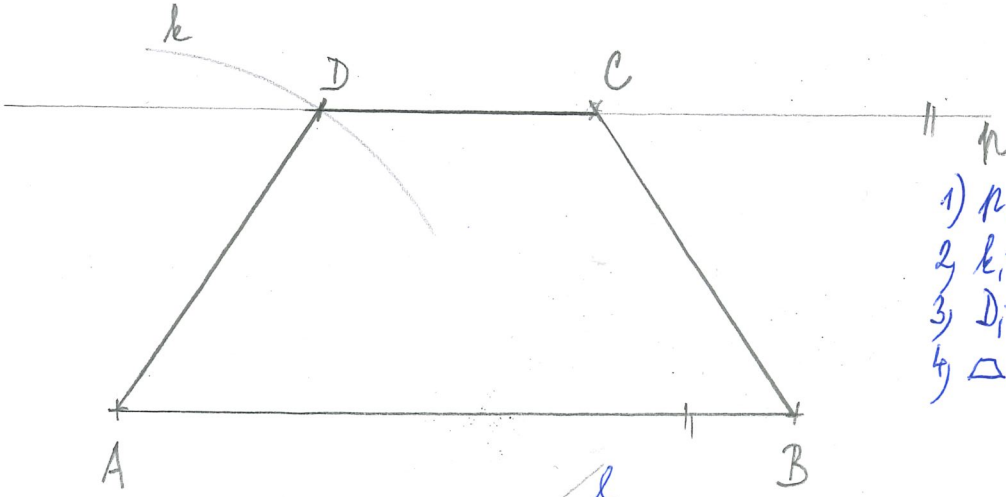
Rozdíl obsahů čtverců:

$S = S_1 - S_2 = 5^2 - 3^2 =$

$= 25 - 9 = \boxed{16cm^2}$

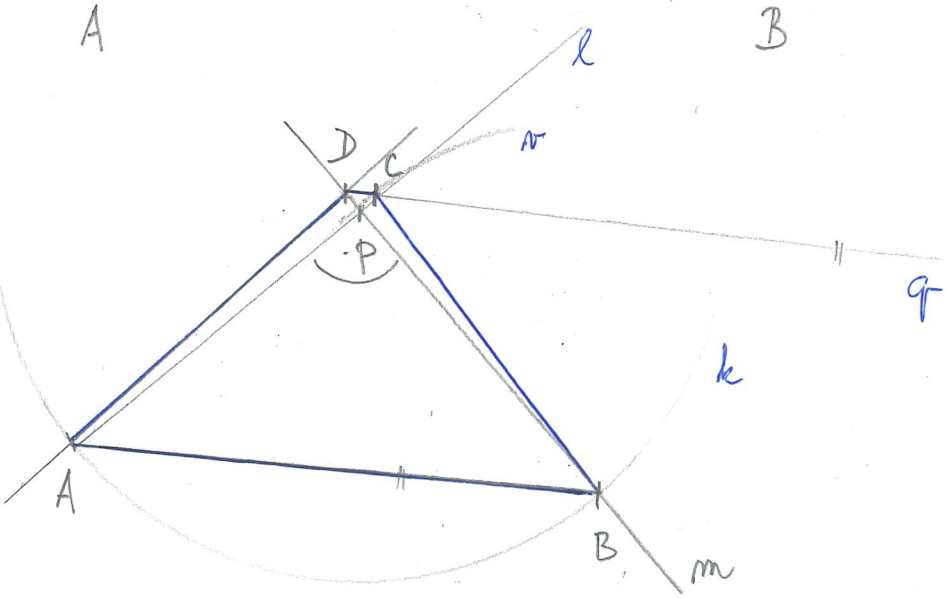
9)

a)



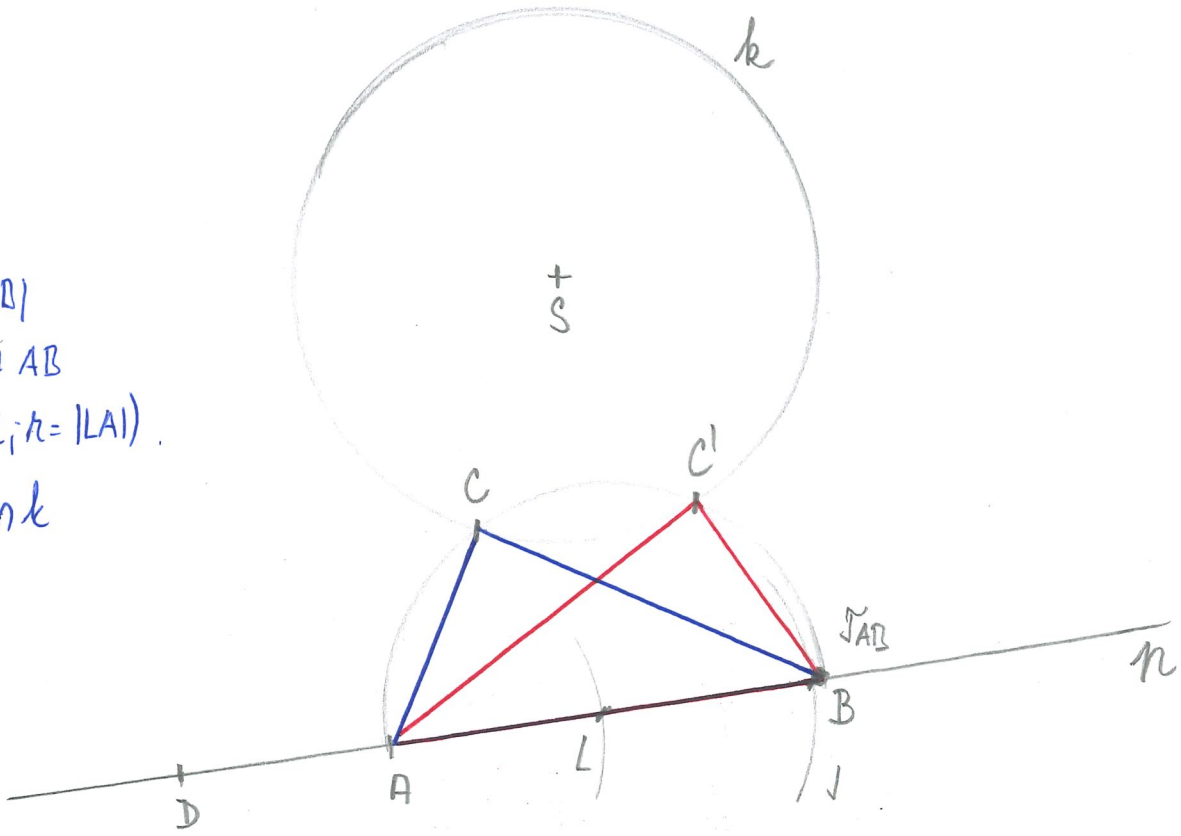
1) p; $p \parallel AB \wedge C \in p$
2) k; $k(A; r = |BC|)$
3) D; $D \in k \cap p$
4) $\square ABCD$

b)



1) l; $l \perp m \wedge A \in m$
2) P; $P \in m \cap l$
3) k; $k(P; r = |PA|)$
4) B; $B \in k \cap m$
5) r; $r(B; r = |AD|)$
6) q; $q \parallel AB \wedge D \in q$
7) C; $C \in q \cap r$
8) $\square ABCD$

10)



1) $2|AD| = |AB|$
2) L; L je střed AB
3) T_{AB}; $T_{AB}(L; r = |LA|)$
4) $C; C \in T_{AB} \cap k$
5) $\triangle ABC$

2 řešení

11) a) $\frac{1}{50}t + \frac{3}{4}q \neq 275\,kg$ (100 kg)

$2\,kg + 75\,kg \neq 275\,kg$

NE

b) $900\,ml - \frac{1}{5}dm^3 \neq \frac{3}{4}l$

$0{,}9l - 0{,}2l \neq 0{,}75l$

NE

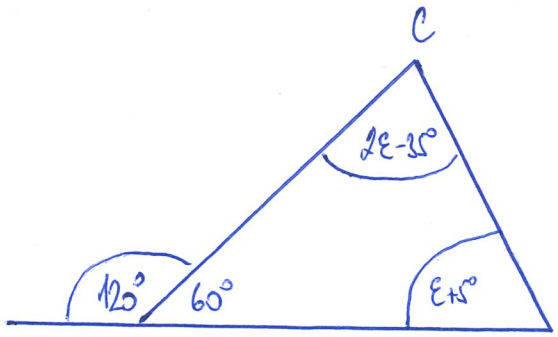
c) $72°15' : 5 =$

$= 70°135' : 5 =$

$= \boxed{14°27'}$

ANO

12)



$2\varepsilon - 35 + \varepsilon + 5 + 60° = 180°$

$3\varepsilon = 150°$

$\varepsilon = 50°$

$\gamma = 2\varepsilon - 35° = 2 \cdot 50 - 35° = \boxed{65°} \Rightarrow$ D

13) Pravidelný čtyřboký hranol – podstava je čtverec

$S_{pláště} = 4 \cdot a \cdot v$

$48 = 4 \cdot a \cdot 4$

$a = \frac{48}{16} = 3\,cm$

$V_{HRANOLU} = a \cdot a \cdot v = 3 \cdot 3 \cdot 4\,dm^3 = 36\,dm^3$

Voda není nepřímo $\frac{36-20}{36} = \frac{16}{36} = \boxed{\frac{4}{9}}$ hrany $\Rightarrow$ C

14) 1) Cena vzrostla o 2% ... $2000 + 0{,}2 \cdot 2000 = 2400,-$

2) Cena poklesla o 25% ... $0{,}75 \cdot 2400 = 1800,-$

3) ↑ 100% ... 2000 ↑
x% ... 1800

$x = \frac{1800 \cdot 100}{2000} = 90\%$ ⇒ **Pokles o 10% → A**

15) 15.1. Senioři – $100\% - 40\% - 25\% = \boxed{35\%}$ ($\frac{2}{5}$)

– $35\% \text{ z } 200 = 0{,}35 \cdot 200 = \boxed{70}$ ⇒ (B)

15.2. Pracující: $0{,}4 \cdot 200 \cdot 200 = 16000,-$

Zbytek: $0{,}25 \cdot 200 \cdot 50 + 0{,}35 \cdot 200 \cdot 100 = 2500 + 7000 = 9500$

$16000 - 9500 = 6500$

$6500 : 100 = \boxed{65}$ ⇒ (A)

15.3. $\frac{50 \cdot 50 + 40 \cdot 100 + 80 \cdot 200}{200} = \frac{2500 + 4000 + 16000}{200} = \frac{25500}{200} = 127{,}5,- =$

$= (130,-)$ ⇒ (F)

16) 16.1. Za minuty bude laser projet 60 políček ($120s : 2s = 60$)

Násobky 3 (●): $60 : 3 = 20$

Násobky 5 (X): $60 : 5 = 12$

Společné násobky 3 a 5 (■): 15; 30; 45; 60 (4)

Bez označení: $60 - 20 - 12 + 4 = \boxed{32}$

16.2. – Každý označený na násobek čísel 3 a 5 – tedy na 15

– 10 ■ .. $10 \cdot 15 = 150$ políček

– 10 políček označen bude označeno za $150 \cdot 2s = \boxed{300\,A}$