3. TESZT

I. Feladatsor

1) $15-15:5 = 15-3 = \boxed{12}$

2) $1000 \cdot 50\% = 10\cancel{00} \cdot \frac{50}{1\cancel{00}} = \boxed{500}$

3) $-3\cdot(-2)\cdot(-1)\cdot 0 \cdot 1 \cdot 2 = \boxed{0}$

4) $K_{négyzet} = 8\,cm \Rightarrow a = 8:4 \Rightarrow \boxed{a=2}$

5) $m(\widehat{A'B', BC}) = m(\widehat{AB, BC}) = \boxed{60°}$

6) $8-3 = \boxed{5}$ -tel többet oldott.

II. Feladatsor:

2) $a = \sqrt{2}\cdot\left(\frac{1}{\sqrt{2}} + \sqrt{2}\right) + 2 = \sqrt{2}\cdot\left(\frac{\sqrt{2}}{2} + \sqrt{2}\right) + 2 =$

$= \sqrt{2}\cdot\left(\frac{\sqrt{2}}{2} + \frac{2\sqrt{2}}{2}\right) + 2 = \sqrt{2}\cdot\frac{3\sqrt{2}}{2} + 2 = \frac{3\cdot\sqrt{2}\cdot\sqrt{2}}{2} + 2 =$

$= \frac{3\cdot\cancel{2}}{\cancel{2}} + 2 = 3+2 = 5 \Rightarrow \underline{a=5}$

$b = \sqrt{3}\cdot\left(\frac{4}{\sqrt{3}} - \sqrt{3}\right) + 4 = \sqrt{3}\cdot\left(\frac{4\sqrt{3}}{3} - \sqrt{3}\right) + 4 =$

$= \sqrt{3}\cdot\left(\frac{4\sqrt{3}}{3} - \frac{3\sqrt{3}}{3}\right) + 4 = \sqrt{3}\cdot\frac{\sqrt{3}}{3} + 4 =$

$= \frac{3}{3} + 4 = 1+4 = 5 \Rightarrow \underline{b=5}$

tehát $a = b$.

3) Legyen a keresett számok a, b, és c

$\{a, b, c\}$ e.a $\{3, 5, 7\}$; a legkisebb szám az $\underline{a}$
a legnagyobb szám a $\underline{c}$

tehát $a + c = 320$

$\frac{a}{3} = \frac{b}{5} = \frac{c}{7} = k$

$\frac{a}{3} = k \Rightarrow a = 3k$ és $\frac{b}{5} = k \Rightarrow b = 5k$

$\frac{c}{7} = k \Rightarrow c = 7k$

$a+c=320$ vagyis

$3k+7k=320 \Rightarrow 10k=320 \Rightarrow k=320:10$

$k=32$

$a=3k \Rightarrow a=3\cdot 32 \Rightarrow a=96$

$b=5k \Rightarrow b=5\cdot 32 \Rightarrow b=160$

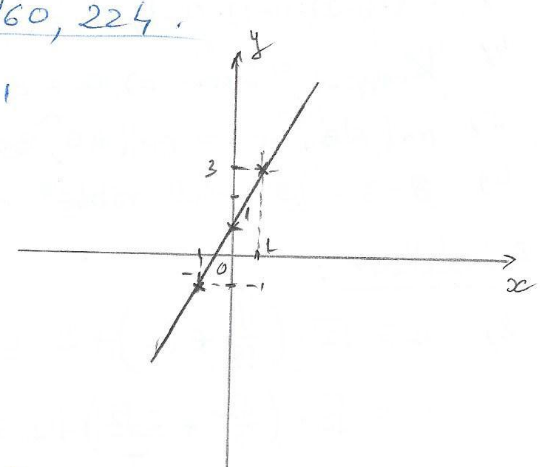
$c=7k \Rightarrow c=7\cdot 32 \Rightarrow c=224$

A keresett számok 96, 160, 224.

4) $f:\mathbb{R}\to\mathbb{R}$; $f(x)=2x+1$

a)

x	-1	0	1
$f(x)$	-1	1	3



$f(-1)=2\cdot(-1)+1=-2+1=-1$

$f(0)=1$

$f(1)=2\cdot 1+1=3$

b) $N=f(0)+f(1)+\ldots+f(10)=1+3+5+7+\ldots+21$

$f(2)=2\cdot 2+1=5$

$f(3)=2\cdot 3+1=7$

$\vdots$

$f(10)=2\cdot 10+1=21$

vagyis kiszámítjuk az $1+3+5+7+\ldots+21$ összeget Gauss-módszerrel

tehát $\underbrace{1+3+5+7+\ldots+21}_{22} = \dfrac{22\cdot 11}{2} = 11\cdot 11 = 121$

vagyis $121=11^2$, felírható egy természetes szám négyzeteként

3. Tesztet

2/5

5) $E(x) = \frac{x}{x^2+3x} - \left(\frac{\overset{x+3}{1}}{x-3} - \frac{\overset{x-3}{1}}{x+3}\right) : \frac{6}{x-3} =$

$= \frac{x}{x\cdot(x+3)} - \frac{x+3-(x-3)}{(x-3)(x+3)} : \frac{6}{x-3} =$

$= \frac{x}{x\cdot(x+3)} - \frac{\cancel{x}+3-\cancel{x}+3}{(x-3)(x+3)} : \frac{6}{x-3} =$

$= \frac{x}{x\cdot(x+3)} - \frac{\cancel{6}}{\cancel{(x-3)}(x+3)} \cdot \frac{\cancel{x-3}}{\cancel{6}} =$

$= \frac{\cancel{x}}{\cancel{x}\cdot(x+3)} - \frac{1}{x+3} =$

$= \frac{1}{x+3} - \frac{1}{x+3} = 0 \Rightarrow \underline{E(x) = 0}$

III. Feladatsor:

1) F: ABCD trapéz

$m(\hat{A}) = 90°$

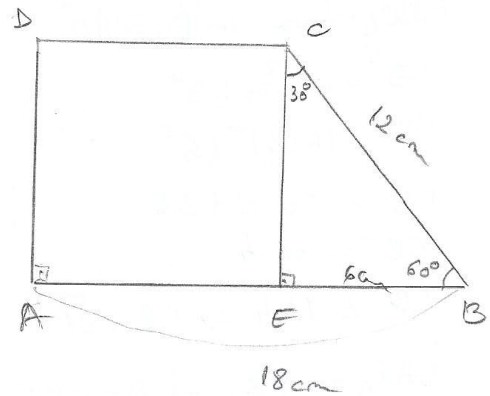
$AB \parallel CD$

$AB = 18\,cm$

$CD = 12\,cm$

$m(\hat{ABC}) = 60°$

$CE \perp AB$, $E \in (AB)$



K: a) $BE = 6cm$

b) $T_{ABCD} = ?$

c) Ha $AF = FE$

$CF \perp BD$

B: a) Az $EBC_\triangle$-ben $m(\hat{E}) = 90°$, $m(\hat{B}) = 60°$ $\Rightarrow m(\hat{C}) = 30°$

$\Downarrow$

$EB = \frac{BC}{2}$

$\Rightarrow EB = \frac{12}{2} \Rightarrow \underline{EB = 6cm}$

b) $T_{ABCD} = \frac{(AB + DC) \cdot CE}{2}$

$DC = AE = AB - EB = 18 - 6 = 12 \Rightarrow DC = 12cm$

$T_{ABCD} = \frac{(18+12) \cdot CE}{2}$

CEB_Δ-ben $m(\hat{E}) = 90°$

$CE^2 = BC^2 - EB^2 \Rightarrow CE^2 = 12^2 - 6^2 \Rightarrow CE^2 = 144 - 36 \Rightarrow CE^2 = 108$

$CE = \sqrt{108} \Rightarrow CE = 6\sqrt{3}cm$

$T_{ABCD} = \frac{(18+12) \cdot 6\sqrt{3}}{2} = \frac{\overset{15}{30} \cdot 6\sqrt{3}}{\underset{1}{2}} = \underline{90\sqrt{3}cm^2}$

c) $DC = 12cm$

$FB = FE + EB = \frac{AE}{2} + EB = 6 + 6 = 12$

$FB = 12cm$

EBC_Δ-ben $m(\hat{E}) = 90°$

$CB^2 = CE^2 + EB^2$

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

$CB^2 = 36 \cdot 3 + 36$

$CB^2 = 36 \cdot 4$

$CB^2 = 144 \Rightarrow CB = \sqrt{144} \Rightarrow CB = 12cm$

$DAF_\Delta \equiv CEB_\Delta \Rightarrow DF = BC = 12cm$

Tehát $DC = CB = FB = DF = 12cm$ és $DC \parallel AB$ $\Big\} \Rightarrow$ DFBC négyszög rombusz

$\Downarrow$

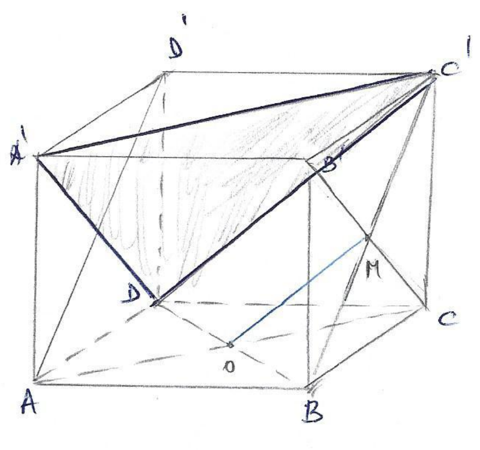
$FC \perp BD$

2./ F: $ABCDA'B'C'D'$ - kocka

$AB = 10cm$

$AC \cap BD = \{O\}$

$B'C \cap BC' = \{M\}$



K: a/ $T_{ABCD} = 100cm^2$

b/ $d(D'; AB) = ?$

c/ $OM \parallel (C'DA')$

B:

a/ $T_{ABCD} = AB^2 \Rightarrow T_{ABCD} = 10^2 \Rightarrow \underline{T_{ABCD} = 100cm^2}$

b./ $d(D'; AB) = AD'$

$$\left.\begin{array}{l} D'D \perp (ABC) \\ AD \subset ABC \\ D'D \perp AD \\ AD \perp AB \end{array}\right\} \xRightarrow{3.\perp} D'A \perp AB$$

$\Downarrow$

$d(D'; AB) = AD'$

$D'AD_\Delta$-ben $m(\hat{D}) = 90°$

$D'A^2 = AD^2 + D'D^2$

$D'A^2 = 10^2 + 10^2$

$D'A^2 = 200 \Rightarrow \underline{D'A = 2\sqrt{10}\ cm}$

c./ ~~A~~ $DC'B_\Delta$-ben

$$\left.\begin{array}{l} DO = OB\ ;\ O \in (DB) \\ C'M = MB\ ;\ M \in (C'B) \end{array}\right\} \Rightarrow OM - \text{középvonal}$$

$\Downarrow$

$OM \parallel DC'$

$$\text{de}\ \left.\begin{array}{l} DC' \subset (C'DA') \\ DC' \parallel OM \end{array}\right\} \Rightarrow OM \parallel (C'DA')$$

3.tétel

5/5