ora a II-a CLASA a VII-a A 25.03.2020

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EXERCIȚII – PRODUSUL CARTEZIAN

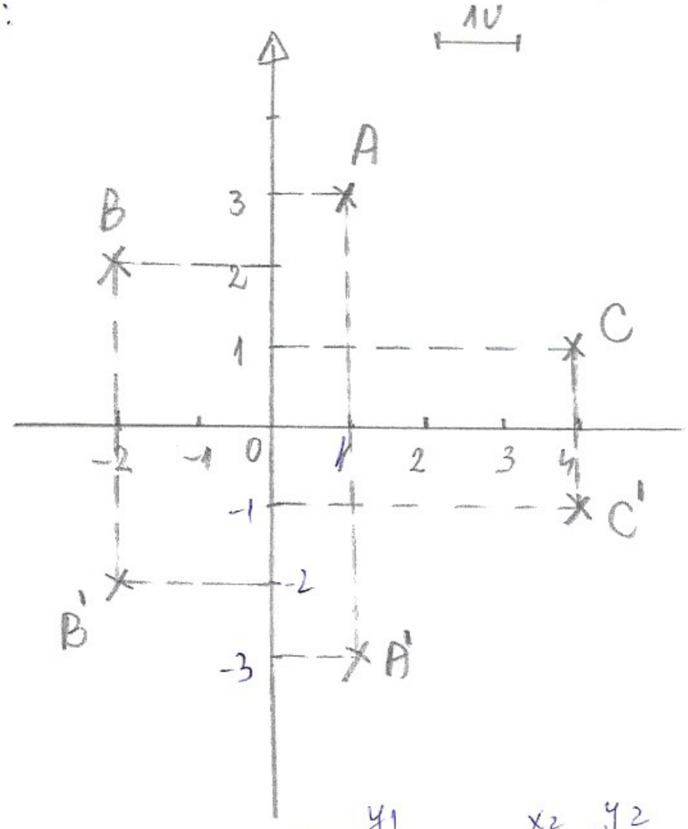
5/40 cul. – mate 2000+.

Fie $A(1,3), B(-2,2), C(4,1)$

a) Reprezentare puncte

b) $A' = sim_{Ox}^{A}$, $B' = sim_{Ox}^{B}$, $C' = sim_{Ox}^{C}$, $A', B', C' = ?$

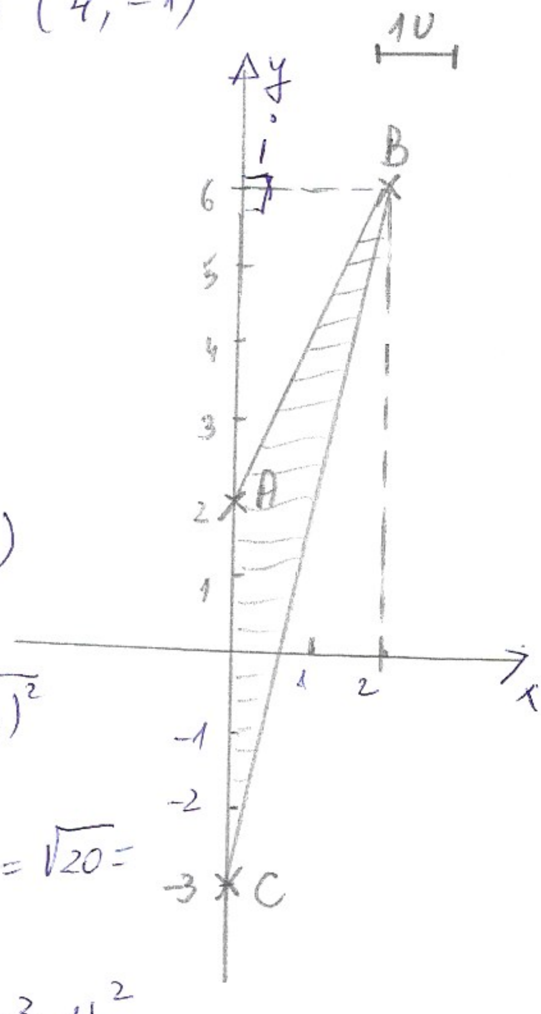
R:



b) $A'(1;-3)$

$B'(-2;-2)$

$C'(4;-1)$



7/40 Fie $A(\overset{x_1}{0};\overset{y_1}{2})$; $B(\overset{x_2}{2};\overset{y_2}{6})$; $C(0;-3)$

a) Reprezentare puncte

b) $AB = ?$ R: $AB = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

c) $\mathcal{A}_{\Delta ABC} = ?$ $AB = \sqrt{(2-0)^2+(6-2)^2}$

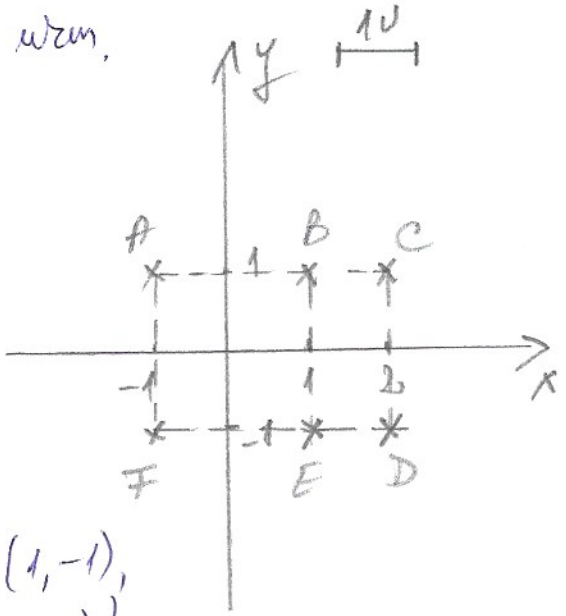
$AB = \sqrt{2^2+4^2} = \sqrt{4+16} = \sqrt{20} =$

$= 2\sqrt{5}\ u$

c) $\mathcal{A}_{\Delta ABC} = \frac{b \cdot h}{2} = \frac{AC \cdot Bi}{2} = \frac{3 \cdot \cancel{2}^{1}}{\cancel{2}_{1}} = 3\ u^2$

$\Rightarrow \Delta$ obtuzunghic $h = Bi$

13/41. $A \times B$ este reprezentat în figura urm.



$A, B = ?$

Punctele au coordonatele:

$A(-1;1), B(1,1), C(2,1), D(2;-1),$
$E(1,-1), F(-1,-1)$

$\Rightarrow A \times B = \{(-1,1),(1,1),(2,1),(2,-1),(1,-1),$
$(-1,-1)\}$

$\Rightarrow A = \{-1, 1, 2\}$
$B = \{1, -1\}$

18/41. Arătați că punctele $A(2,3)$, $B(2,-2)$, $C(2,5)$ - coliniare.

R: Pentru ca A, B, C coliniare, trebuie ca $AB + BC = AC$.

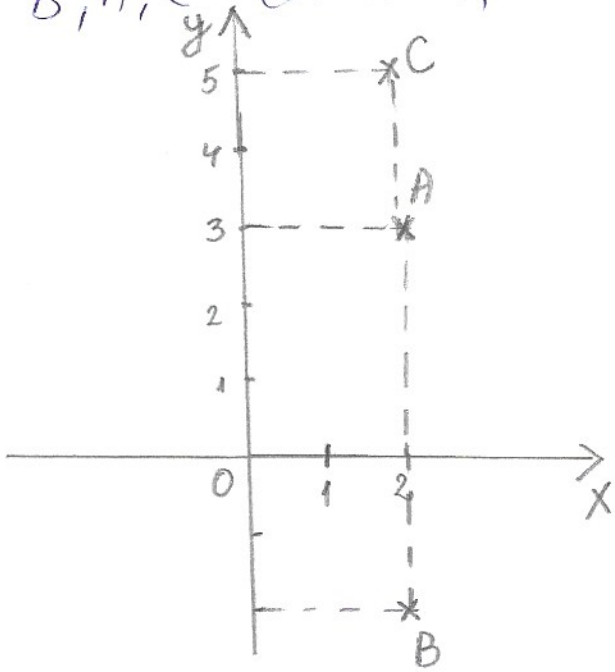
$AB = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} = \sqrt{(2-2)^2+(-2-3)^2} = \sqrt{0^2+(-5)^2} = \sqrt{25} = 5u$

$BC = \sqrt{(2-2)^2+(5-(-2))^2} = \sqrt{0^2+(5+2)^2} = \sqrt{7^2} = 7u$

$AC = \sqrt{(2-2)^2+(5-3)^2} = \sqrt{0^2+2^2} = \sqrt{2^2} = 2u$.

Se obs. că $AB + AC = BC \Rightarrow B, A, C$ - coliniare, în această ordine.

Verificăm prin reprezentare:



21/42. $m, n, p, q \in \mathbb{R} = ?$ a.î.

a) $M(5; m)$; $N(-3; n-2)$; $P(p+1, 3p-2)$; $Q(\sqrt{2}; q-\sqrt{2}) \in Ox$

axa abscisselor.

$A(x,y) \in Ox \Rightarrow y = 0$

$M(5, m) \in Ox \Rightarrow m = 0$

$N(-3; n-2) \in Ox \Rightarrow n-2=0 \Rightarrow n = 2$

$P(p+1, 3p-2) \in Ox \Rightarrow 3p-2=0 \Rightarrow 3p = 2 \Rightarrow p = \frac{2}{3}$

$Q(\sqrt{2}; q-\sqrt{2}) \in Ox \Rightarrow q-\sqrt{2}=0 \Rightarrow q = \sqrt{2}$.

b) $M(m, 1)$, $N(3-n; 1)$; $P(15+3p; 8)$; $Q(8-q\sqrt{2}, 7) \in Oy$

axa ordonatelor

$A(x,y) \in Oy \Rightarrow x = 0$.

$M(m, 1) \in Oy \Rightarrow m = 0$

$N(3-n; 1) \in Oy \Rightarrow 3-n=0 \Rightarrow -n=-3 \Rightarrow n=3$

$P(15+3p; 8) \in Oy \Rightarrow 15+3p=0 \Rightarrow 3p=-15 \Rightarrow p=-5$

$Q(8-q\sqrt{2}; 7) \in Oy \Rightarrow 8-q\sqrt{2}=0 \Rightarrow q\sqrt{2}=8 \Rightarrow q = {}^{\sqrt{2})}\frac{8}{\sqrt{2}} = \frac{8\sqrt{2}}{2} =$

$= 4\sqrt{2}$

26/42. Fie $A(2; 3)$; $B(4; x)$

$x \in \mathbb{R} = ?$ a.î. $AB = 2\sqrt{5}$.

$AB = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} = \sqrt{(4-2)^2+(x-3)^2} = \sqrt{2^2+(x-3)^2}$

$AB = 2\sqrt{5} \Rightarrow \sqrt{2^2+(x-3)^2} = 2\sqrt{5} \quad |^2$

$2^2+(x-3)^2 = 2^2 \cdot 5$

$(x-3)^2 = 2^2 \cdot 5 - 2^2$

$(x-3)^2 = 16 \Rightarrow \quad x-3 = \pm\sqrt{16} \Rightarrow x-3=4$ sau $x-3=-4$

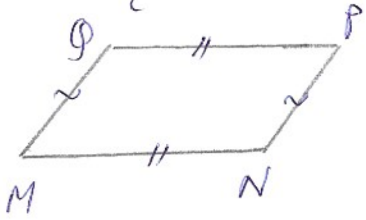
$x = 7 \qquad x = -1$

$S = \{-1; 7\}$.

30/43 Fie $M(1,3)$, $N(2,1)$, $P(-2,-5)$, $Q(-3;-3)$

Arătați că MNPQ – paralelogram.

MNPQ = paralelogram $\Leftrightarrow$ $MN = PQ$ și $NP = MQ$.



$$MN = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} =$$

$$= \sqrt{(2-1)^2+(1-3)^2} = \sqrt{1^2+(-2)^2} = \sqrt{5}$$

$$PQ = \sqrt{(-3-(-2))^2+(-3-(-5))^2} = \sqrt{(-3+2)^2+(-3+5)^2} = \sqrt{(-1)^2+2^2} = \sqrt{5}$$

$\Rightarrow$ $MN = PQ$ (1)

$$NP = \sqrt{(-2-2)^2+(-5-1)^2} = \sqrt{(-4)^2+(-6)^2} = \sqrt{16+36} = \sqrt{52} = 2\sqrt{13}$$

$$MQ = \sqrt{(-3-1)^2+(-3-3)^2} = \sqrt{(-4)^2+(-6)^2} = - - = 2\sqrt{13}$$

$\Rightarrow$ $NP = MQ$ (2)

Din 1) și 2) $\Rightarrow$ MNPQ – paralelogram.

<u>TEMĂ</u> – până la prima oră după vacanță:

culegere pag 40–43 / ex: 6, 8, 9, 14, 15, 20, 27, 34, 39.