

RECAPITULARE - PRODUS CARTEZIANTEORIE: 1) $A, B =$ mulțimi nevide $A \times B = \{(a, b) \mid a \in A, b \in B\}$ - produsul cartezian al lui A și B .2) Dacă $A(x_1, y_1), B(x_2, y_2) =$ punctea) $AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ - distanța dintre A și B b) $M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$ - coordonatele mijlocului segmentului AB .TESTUL 1 / pag 44 eul.

$$\text{I. } \textcircled{1} \begin{array}{l} \overset{x_1}{\downarrow} \quad \overset{y_1}{\rightarrow} \\ A(3, 2) \\ \overset{x_2}{\downarrow} \quad \overset{y_2}{\downarrow} \\ B(-2, -4) \end{array}$$

$$\begin{aligned} \Rightarrow AB &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = \\ &= \sqrt{(-2 - 3)^2 + (-4 - 2)^2} = \\ &= \sqrt{(-5)^2 + (-6)^2} = \sqrt{25 + 36} = \sqrt{61} \text{ m} \end{aligned}$$

$$\textcircled{2} \begin{array}{l} A(4, -6) \\ B(-2, 2) \end{array}$$

$$\Rightarrow x_M = \frac{x_1 + x_2}{2} = \frac{4 + (-2)}{2} = \frac{2}{2} = 1$$

$$y_M = \frac{y_1 + y_2}{2} = \frac{-6 + 2}{2} = \frac{-4}{2} = -2$$

$$\textcircled{3} \begin{array}{l} A(12, 16) \\ B(9, 12) \\ C(8, 13) \end{array}$$

$$AB = \sqrt{(9 - 12)^2 + (12 - 16)^2} = \sqrt{(-3)^2 + (-4)^2} = \sqrt{25} = 5 \text{ m}$$

$$BC = \sqrt{(8 - 9)^2 + (13 - 12)^2} = \sqrt{(-1)^2 + 1^2} = \sqrt{2} \text{ m}$$

$$AC = \sqrt{(8 - 12)^2 + (13 - 16)^2} = \sqrt{(-4)^2 + (-3)^2} = \sqrt{16 + 9} = 5 \text{ m}$$

$$P_{\Delta ABC} = ?$$

$$P_{\Delta ABC} = AB + BC + AC = 5 + \sqrt{2} + 5 = (10 + \sqrt{2}) \text{ m.}$$

-②-

4. La fel ca m 3.

5. $A(0,12)$

$B(16,0)$

$C(0,-12)$

$D(-9,0)$

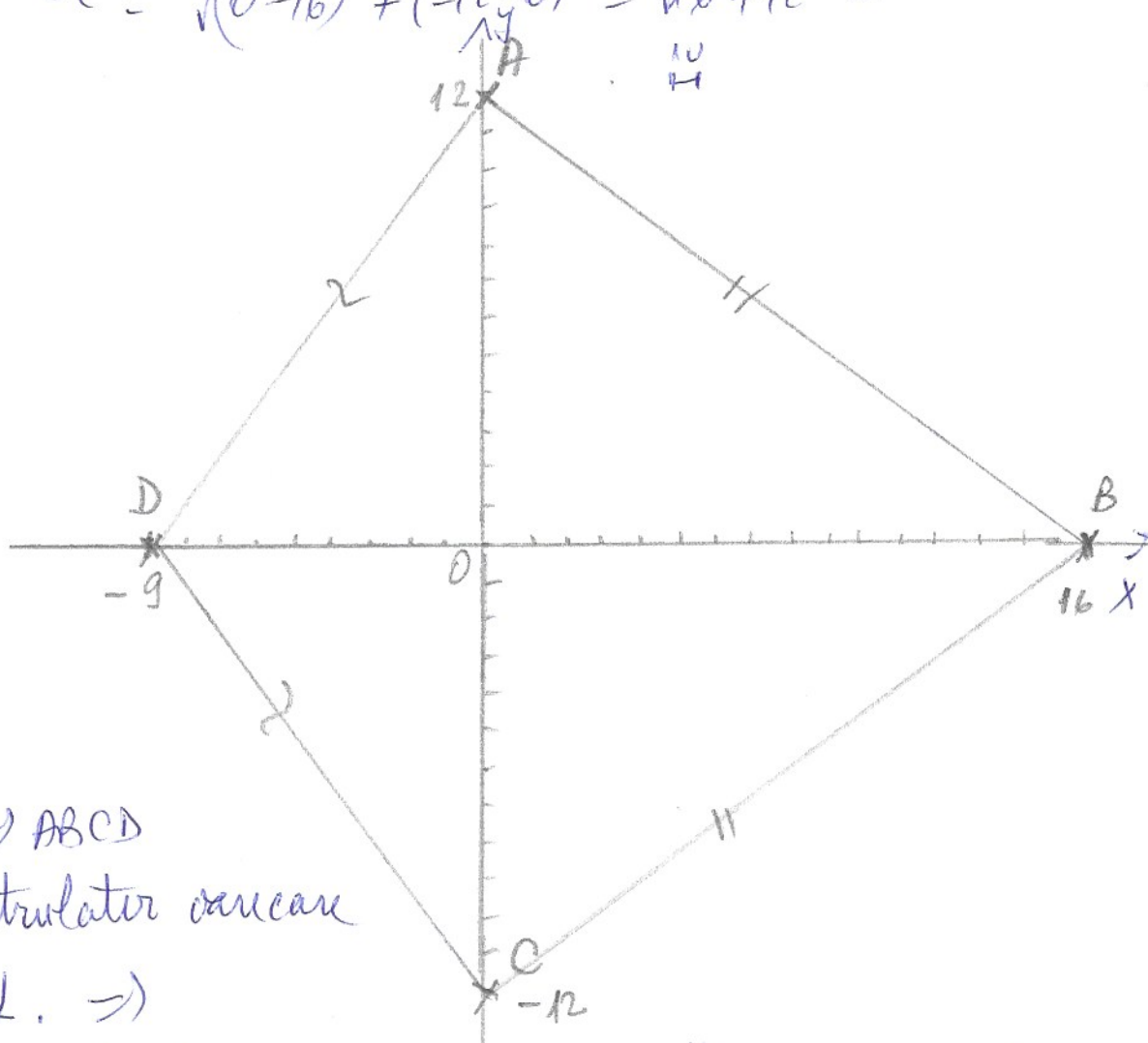
$A_{ABCD} = ?$

$$AB = \sqrt{(16-0)^2 + (0-12)^2} = \sqrt{16^2 + 12^2} = \sqrt{4^2 \cdot (4^2 + 3^2)} = \sqrt{4^2 \cdot 5^2} = 4 \cdot 5 = 20 \mu$$

$$CD = \sqrt{(-9-0)^2 + (0-(-12))^2} = \sqrt{9^2 + 12^2} = \sqrt{3^2 \cdot (3^2 + 4^2)} = \sqrt{3^2 \cdot 5^2} = 3 \cdot 5 = 15 \mu$$

$$AD = \sqrt{(-9-0)^2 + (0-12)^2} = \sqrt{9^2 + 12^2} = 15 \mu$$

$$BC = \sqrt{(0-16)^2 + (-12-0)^2} = \sqrt{16^2 + 12^2} = 20 \mu$$



$AB=BC$
 $AD=CD$

$\} \Rightarrow ABCD$
patrulater cu latur

cu diag. \perp . \Rightarrow

$$\Rightarrow A_{ABCD} = \frac{d_1 \cdot d_2}{2} = \frac{AC \cdot BD}{2} = \frac{24 \cdot 25}{2} = 400 \mu^2$$

6. La fel la 5.

-③-

II. 1. La fel ca I2,

2. $A(11,6)$

$M(1,7)$

$B(x_B, y_B) = ?$

$M = \text{mijl. } AB$

$$M\text{-mijl. } (AB) \Rightarrow x_M = \frac{x_A + x_B}{2}$$

$$1 = \frac{11 + x_B}{2} \Rightarrow 11 + x_B = 2$$

$$x_B = -11 + 2$$

$$\boxed{x_B = -9}$$

$$y_M = \frac{y_A + y_B}{2} \Rightarrow 7 = \frac{6 + y_B}{2} \Rightarrow 6 + y_B = 14$$

$$y_B = 14 - 6$$

$$\boxed{y_B = 8}$$

$B(-9, 8)$.

3. $A(a, 3)$

$B(2, 7)$

$a \in \mathbb{R} = ?$

$AB = 5$.

$$AB = \sqrt{(2-a)^2 + (7-3)^2}$$

$$5 = \sqrt{(2-a)^2 + 4^2} / ^2$$

$$25 = (2-a)^2 + 16$$

$$(2-a)^2 = 25 - 16$$

$$(2-a)^2 = 9 \Rightarrow 2-a = \pm\sqrt{9}$$

$$2-a = 3$$

$$2-a = -3$$

$$-a = 3 - 2$$

$$-a = -3 - 2$$

$$-a = 1 / \cdot (-1)$$

$$-a = -5 / \cdot (-1)$$

$$a = -1$$

$$a = 5$$

$a \in \{-1, 5\}$.

4. $A(9, -5)$

$M(-1, 7)$

$B = \text{sym } A$
M

$B(a, b) = ?$

$a, b = ?$



$\text{Sym } B = \text{sym } A \Rightarrow M = \text{midpt. } [AB]$

$\Rightarrow x_M = \frac{x_A + x_B}{2} \Rightarrow -1 = \frac{9 + a}{2} \Rightarrow 9 + a = -2$

$a = -2 - 9$

$a = -11$

$y_M = \frac{y_A + y_B}{2} \Rightarrow 7 = \frac{-5 + b}{2} \Rightarrow -5 + b = 14$

$b = 14 + 5$

$b = 19$

III: 1) $M(1, 2)$

$N(2, 2)$

$P(2, 1)$

$\Delta MNP = \text{isoscel?}$

$A, P_{\Delta MNP} = ?$

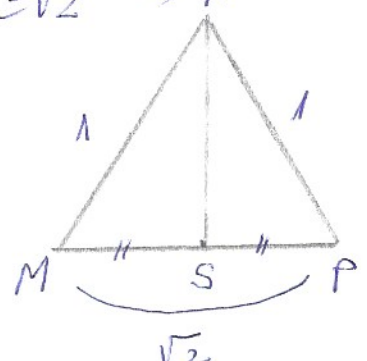
$MN = \sqrt{(2-1)^2 + (2-2)^2} = 1$

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

$MP = \sqrt{(2-1)^2 + (1-2)^2} = \sqrt{1+1} = \sqrt{2} \Rightarrow N$

$\Rightarrow \Delta MNP = \text{isoscel}$

$P = 1 + 1 + \sqrt{2} = (2 + \sqrt{2}) \mu$



The S-midpt (MP) $\Rightarrow S\left(\frac{2+1}{2}, \frac{1+2}{2}\right) = S\left(\frac{3}{2}, \frac{3}{2}\right)$

Calc. $NS = \sqrt{\left(\frac{3}{2} - 2\right)^2 + \left(\frac{3}{2} - 2\right)^2} = \sqrt{2 \cdot \left(\frac{3-4}{2}\right)^2} = \sqrt{2 \cdot \left(-\frac{1}{2}\right)^2} =$
 $= \sqrt{2 \cdot \frac{1}{4}} = \sqrt{\frac{1}{2}} = \frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{2} \mu$

et $\Delta MNP = \frac{MP \cdot NS}{2} = \frac{\sqrt{2} \cdot \frac{\sqrt{2}}{2}}{2} = \frac{\frac{2}{2}}{2} = \frac{1}{2} \mu^2$

2. Verificati dacă punctele $A(1, 1)$, $B(2, -1)$, $C(3, -3)$ sunt coliniare.

—4

Punctele A, B, C - coliniare $\Leftrightarrow AB + BC = AC$

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

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

$$AC = \sqrt{(3-1)^2 + (-3-1)^2} = \sqrt{2^2 + (-4)^2} = \sqrt{4+16} = \sqrt{20} = 2\sqrt{5}$$

$\Rightarrow AB + BC = AC \Rightarrow A, B, C$ - coliniare



3. $A(11, -5)$

$M(-1, 3)$

$B(-2m+3, 2n+7)$

$m, n \in \mathbb{R}$ și? a.i. $M = mijl(AB)$

—4

$$M - mijl(AB) \Rightarrow x_M = \frac{x_A + x_B}{2} \Rightarrow -1 = \frac{-2m+3+11}{2} \Rightarrow -2m+14 = -2$$

$$-2m = -16$$

$$y_M = \frac{y_A + y_B}{2} \Rightarrow 3 = \frac{-5+2n+7}{2} \Rightarrow 2n+2=6$$

$$2n = 4$$

$$n = 2$$

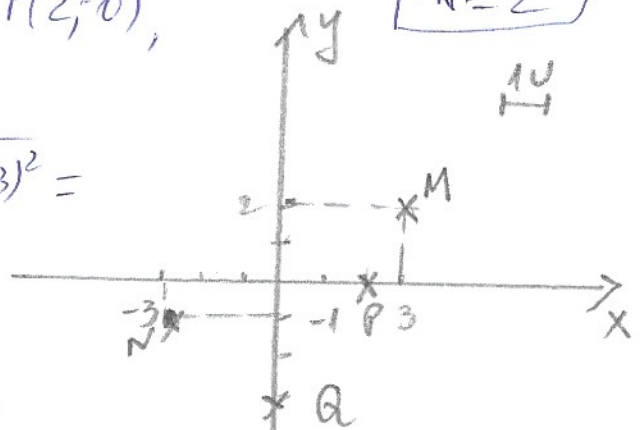
4. a) Repr. $M(3, 2)$, $N(-3, -1)$, $P(2, 0)$,

$Q(0, -3)$

$$b) MN = \sqrt{(-3-3)^2 + (-1-2)^2} = \sqrt{(-6)^2 + (-3)^2} = \sqrt{45} = 3\sqrt{5} \mu$$

$$NP = \sqrt{(2+3)^2 + (0+1)^2} = \sqrt{26} \mu$$

$$PQ = \sqrt{(0-2)^2 + (-3-0)^2} = \sqrt{13} \mu$$



TEMA până luni: TESTUL 2 / pag 45cul.