S I

1. $10+1 = 11$ d)

2. $a \cdot b = 20$ d)

3. -5 a)

4. $1,3 = \frac{13}{10}$ b)

5. $2\sqrt{2} \cdot \frac{1}{2\sqrt{2}} = 1.$ c)

6. A → 28 ani;

C → 13 ani;

$28 + 2 = 2 \cdot (13+2)$

$30 = 2 \cdot 15$ (A)

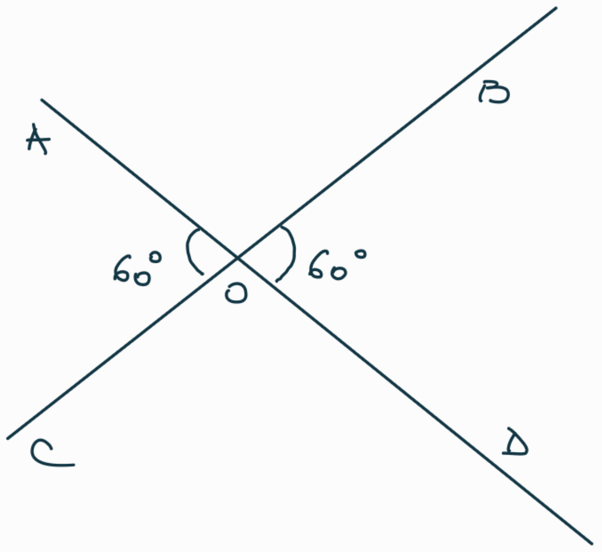
a)

S II

1.

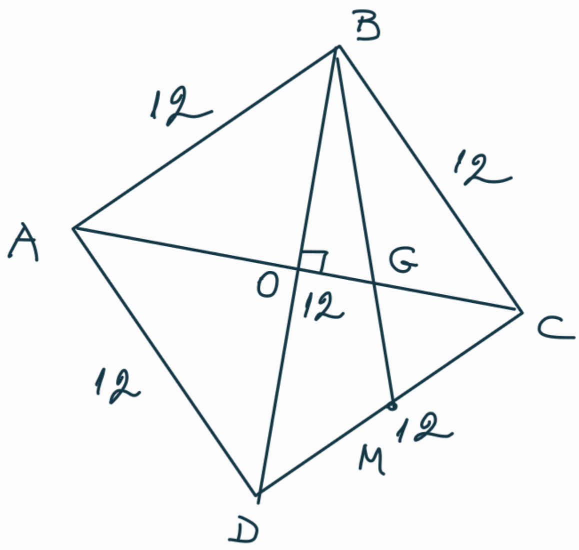
$CD = 40$ d)

2.



b)

3.



$OG = \frac{1}{3} OC$

$OC = \frac{12\sqrt{3}}{2} = 6\sqrt{3}$

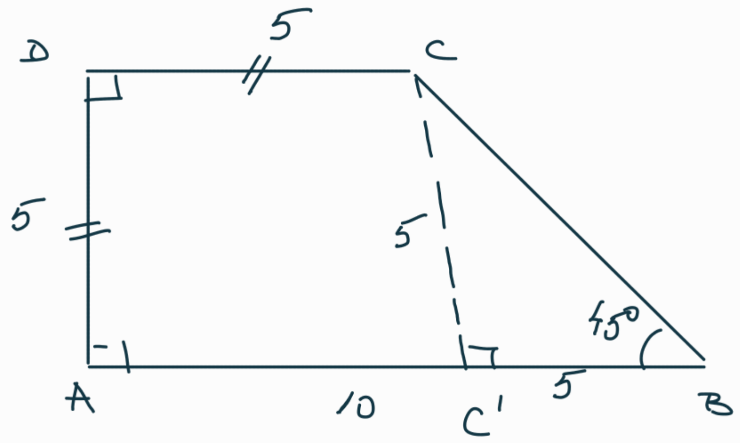
$OG = \frac{1}{3} 6\sqrt{3} = 2\sqrt{3}$

$AG = AO + OG = 6\sqrt{3} + 2\sqrt{3} = 8\sqrt{3}$ d)

4

$\sphericalangle ABC = 45^\circ$

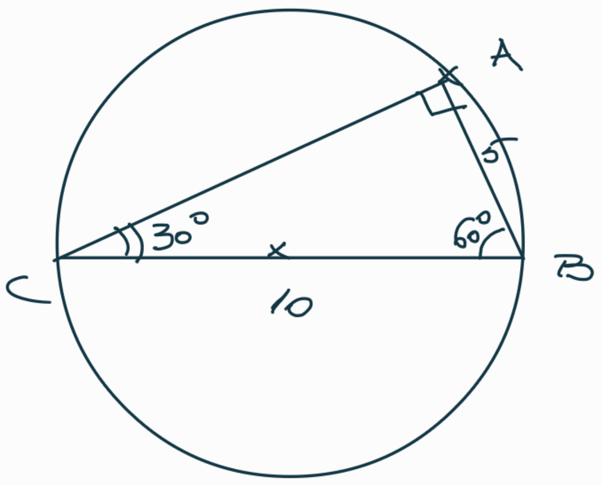
b)



5.

$AB = 5$

a)

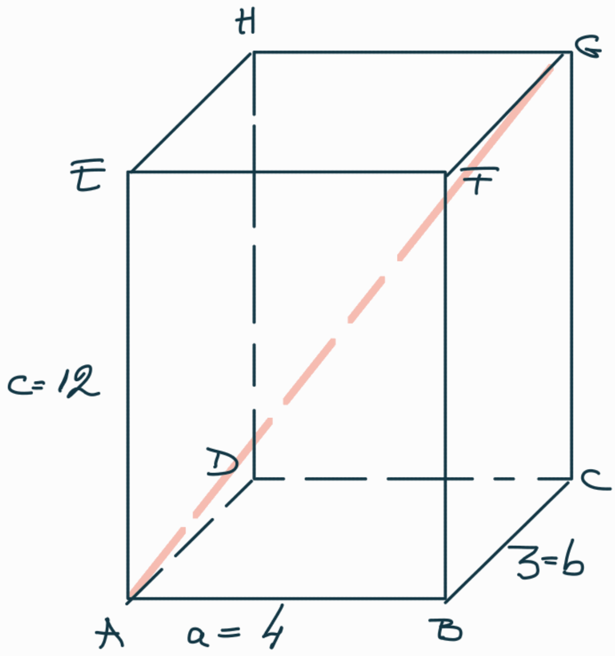


6.

$$AG = \sqrt{a^2+b^2+c^2} =$$

$$= \sqrt{16+9+144}$$

$$= \sqrt{169} = 13$$



b)

S III

$$\begin{cases} A+M+V = 396 \text{ timbre.} \\ A = M+25 \\ A = V-16 \end{cases}$$

$$+\begin{cases} 132 = M+25 \\ 132 = V-16 \end{cases}$$

$$264 = M+V+9 \Rightarrow M+V = 264-9$$

$$M+V = 255$$

$$A + M+V = 396$$

$$A + 255 = 396 \qquad A = 396 - 255 = 141$$

$$132 \neq 141 \quad (F)$$

b) $V = ?$

$$\begin{cases} A + M + V = 396 \\ A = M + 25 \Rightarrow M = A - 25 \\ A = V - 16 \Rightarrow V = A + 16 \end{cases}$$

$$A + A - 25 + A + 16 = 396$$

$$3A = 396 + 9$$

$$3A = 405 \Rightarrow A = 135$$

$$V = A + 16 = 151$$

2. a) $E(x) = x^2 + 2x + 1 + 2(x^2 - 2x + 1) - 3x^2 + 3 =$

$= \cancel{x^2} + \underline{2x} + 1 + \cancel{2x^2} \underline{- 4x} + 2 - \cancel{3x^2} + 3$

$= -2x + 6$ (A)

b) $x = ?$

$$E(x) < x$$

$$-2x + 6 < x$$

$$-3x < -6 \quad / : (-3)$$

$$x > 2$$

$$x \in (2, +\infty)$$

3. $f : \mathbb{R} \to \mathbb{R}$ $f(x) = x - 1$

a) $f(0) = -1$
$f(1) = 0$

$f(0) + f(1) = -1$. (A)

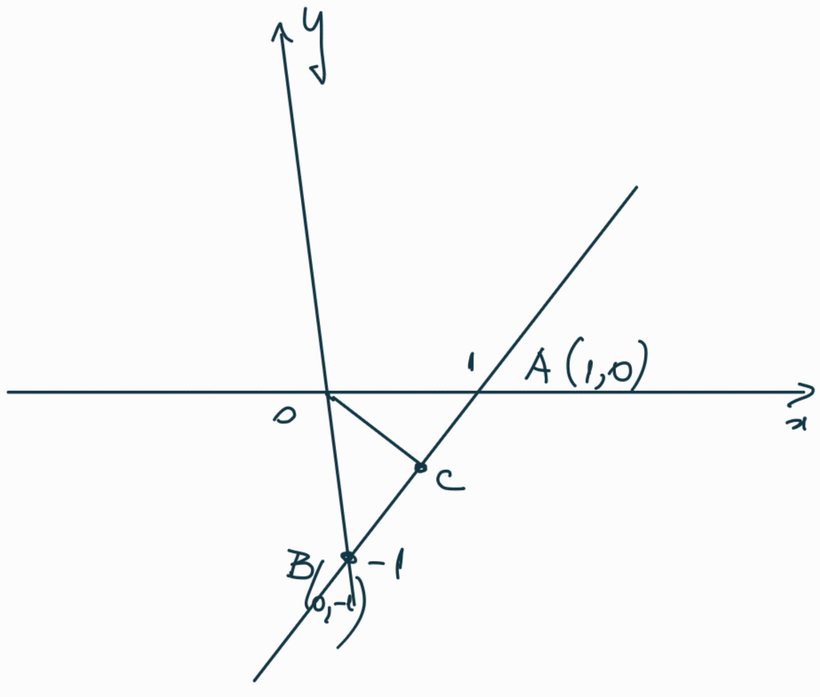
b)

$\cap Ox$ $f(x) = 0$

$x - 1 = 0$

$x = 1$

$\cap Oy$ $f(0) = -1$



$A_{\Delta OBC} = ?$

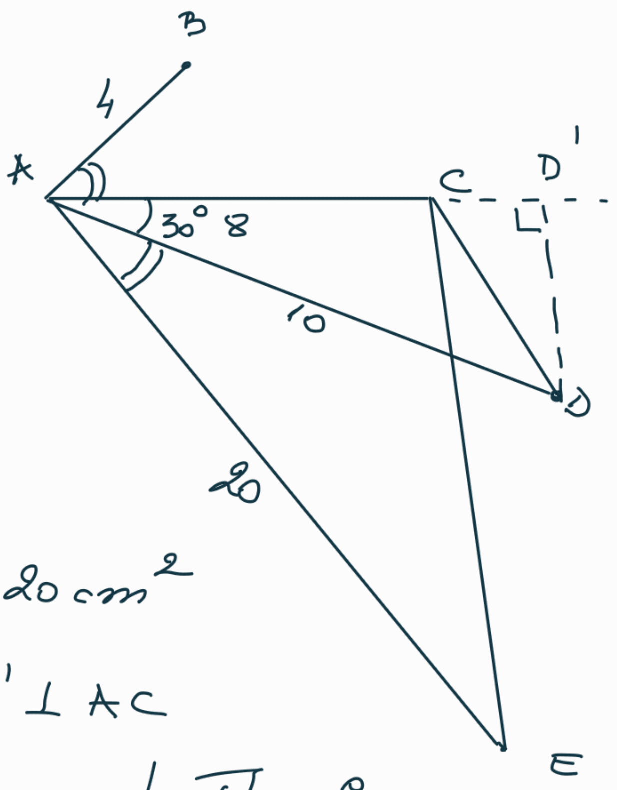
ΔOAB = isoscel $f = OA = OB = 1$

$\sphericalangle BOA = 90^\circ$ $\Rightarrow$

$$A_{\Delta OBA} = \frac{OA \cdot OB}{2} = \frac{1}{2}, \quad C = \text{mij. } AB$$

$$A_{\Delta OBC} = \frac{A_{\Delta OBA}}{2} = \frac{1}{4}$$

4.



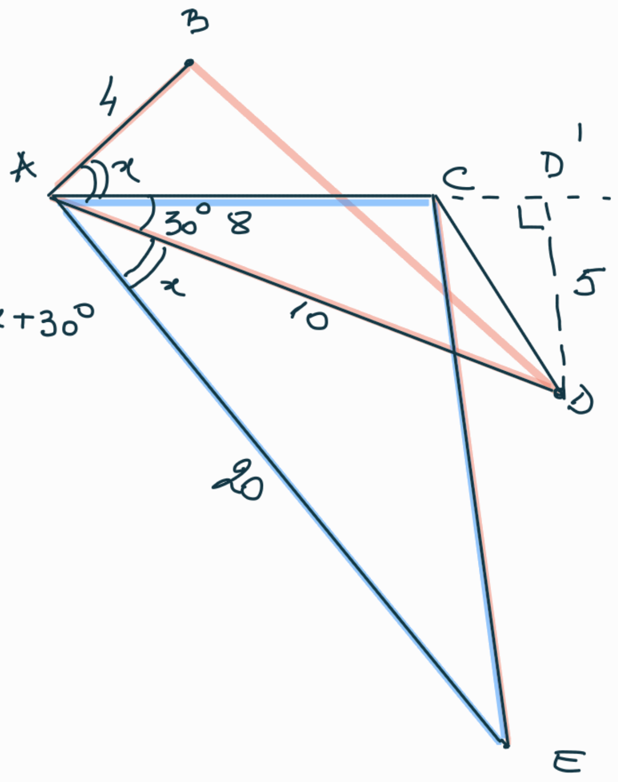
a) $A_{\Delta CAD} = 20 \text{ cm}^2$

Duc $DD' \perp AC$

În $\Delta ADD'$, $\sphericalangle D' = 90^\circ$ / Th 30° $\Rightarrow$ $DD' = 5 = \frac{AD}{2}$

$$A_{\Delta CAD} = \frac{CA \cdot DD'}{2} = \frac{\overset{4}{\cancel{8}} \cdot 5}{\cancel{2}} = 20$$

b) $CE = 2 \cdot BD$



$\Delta ABD \sim \Delta ACE$

$\sphericalangle BAD \equiv \sphericalangle CAE = x + 30^\circ$

$AB = 4$ $\quad AC = 8$

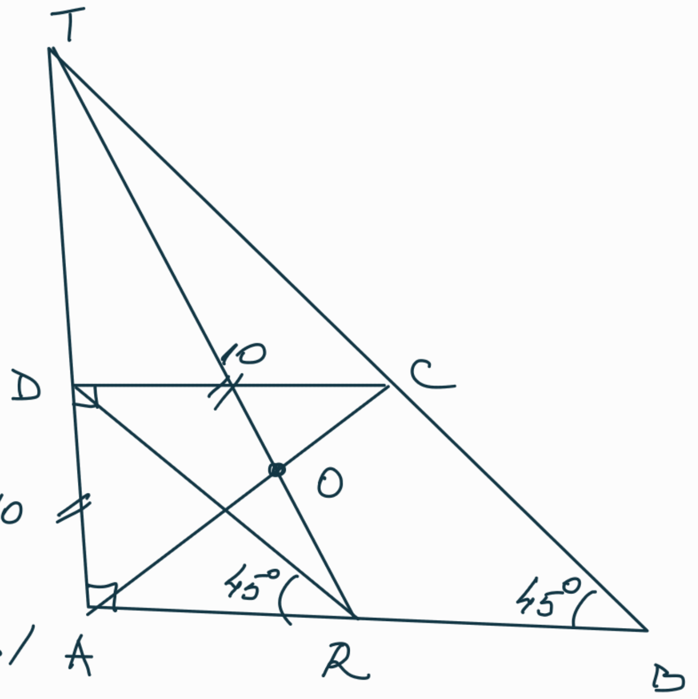
$AE = 20$ $\quad AD = 10$

$$\frac{AB}{AC} = \frac{AD}{AE} = \frac{1}{2}$$

$\Rightarrow$ $\Delta ABD \sim \Delta ACE$ $\Rightarrow$ $\frac{BD}{CE} = \frac{1}{2}$ $\Rightarrow$ $2BD = CE$

5.

$DR \parallel BC$



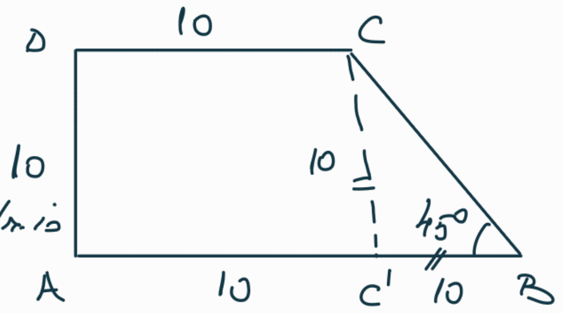
c $\{$ R = mij AB

D $\{$ $DR \parallel BC$

$\Rightarrow \sphericalangle ARD \equiv \sphericalangle ABC = 45^\circ$

$\Rightarrow \Delta ADR$ = dr. isoscel

$AR \equiv AD = 10$



$CC' \perp AB$

$\sphericalangle CBA = 45^\circ$ $\Rightarrow \Delta CBC'$ = dr. is

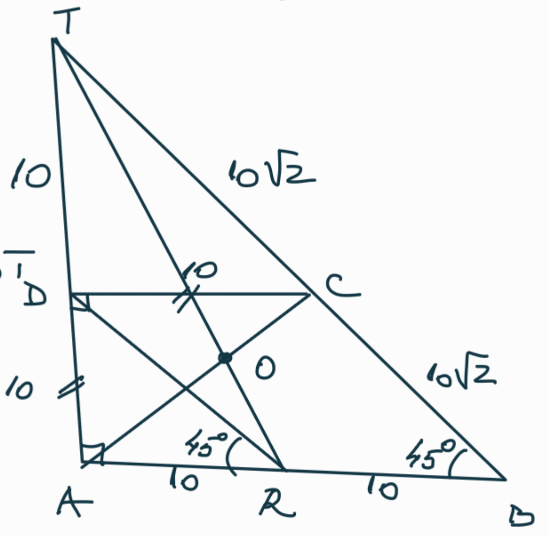
$\Rightarrow CC' = BC' = 10$

$\Rightarrow AB = AC' + C'B = 20$

$AR = 10$ $\Rightarrow R$ = mij AB

b) $TO = ?$

$DC \parallel AB \overset{T.F.A}{\Rightarrow} \frac{DC}{AB} = \frac{TD}{TA} = \frac{TC}{TB} = \frac{10}{20} = \frac{1}{2}$



$\Rightarrow D, C$ = mij AT, BT

În ΔABT

R = mij AB

C = mij TB $\Rightarrow O$ = centr. greutate

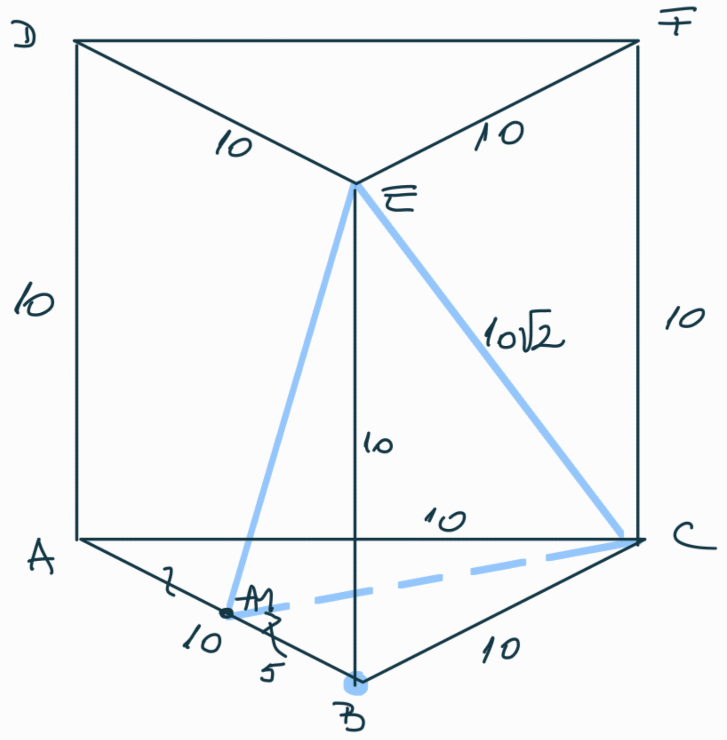
$\Rightarrow TO = \frac{2}{3} TR$; $TR^2 = 400 + 100 = 500$

$TR = 10\sqrt{5}$

$TO = \frac{2}{3} \cdot 10\sqrt{5} = \frac{20\sqrt{5}}{3}$

6.

a) $\triangle ABC$ = echilateral



$V_{ABCDEF} = A_b \cdot h =$

$= \frac{\cancel{100}^{25}\sqrt{3}}{\cancel{4}} \cdot 10$

$= 250\sqrt{3}\ cm^3$

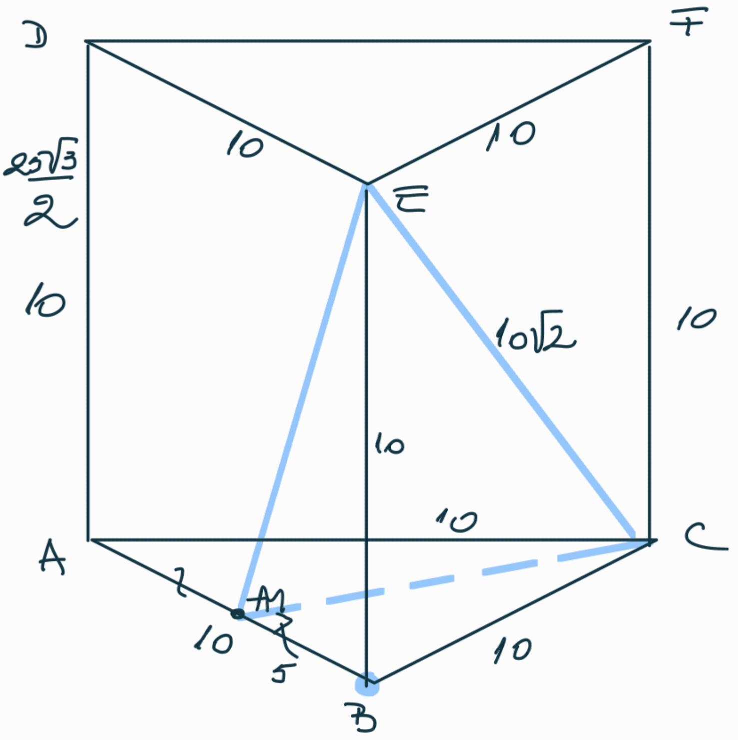
b) $V_{pir\ EMBC} = \frac{EB \cdot A_{\triangle MBC}}{\cancel{3}} = \frac{d(B,(EMC)) \cdot A_{\triangle EMC}}{\cancel{3}}$

$\Rightarrow d(B,(EMC)) = \frac{EB \cdot A_{\triangle MBC}}{A_{\triangle EMC}}$

- $EB = 10$
- $A_{\triangle MBC} = \frac{MC \cdot MB}{2} = \frac{5\sqrt{3} \cdot 5}{2} = \frac{25\sqrt{3}}{2}$

$MC = h_3 = \frac{10\sqrt{3}}{2} = 5\sqrt{3}$

- $A_{\triangle EMC} = ?$



$EB \perp (ABC)$

$MB \perp MC$

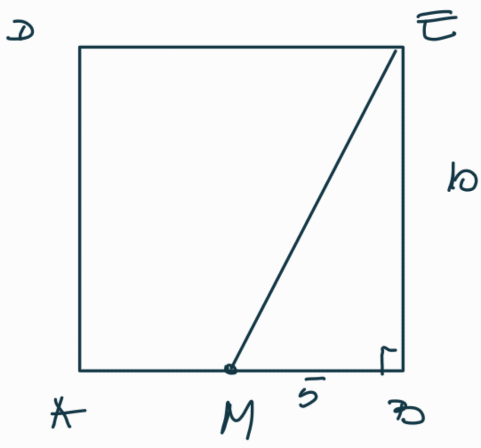
$MC, MB \subset (ABC)$

$\xrightarrow{Th.\ 3\perp}$ $EM \perp MC \Rightarrow$

$\Rightarrow \triangle EMC$ = dr

$\sphericalangle M = 90°$.

- $A_{\triangle EMC} = \frac{EM \cdot MC}{2} = \frac{5\sqrt{5} \cdot 5\sqrt{3}}{2} = \frac{25\sqrt{15}}{2}$



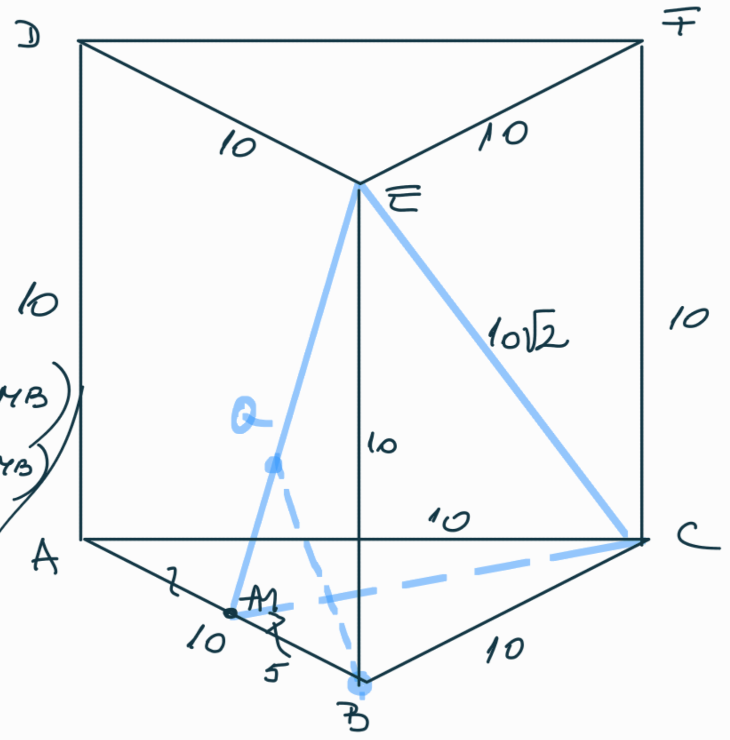
$$EM^2 = EB^2 + MB^2 = 100 + 25$$

$$EM = \sqrt{125} = 5\sqrt{5}$$

$$d(B,(EMC)) = \frac{EB \cdot A_{\Delta MBC}}{A_{\Delta EMC}} = \frac{10 \cdot \frac{\cancel{25}\sqrt{3}}{\cancel{2}}}{\frac{\cancel{25}\sqrt{15}}{\cancel{2}}} = \frac{10\cancel{\sqrt{3}}}{\cancel{\sqrt{15}}_{\sqrt{5}}}$$

$$d(B,(EMC)) = \frac{10}{\sqrt{5}} = \frac{10\sqrt{5}}{5} = 2\sqrt{5} \text{ cm.}$$

ALTFEL :



Duc $BQ \perp EM$ (1)

$$\left.\begin{array}{l} MC \perp MB \\ MC \perp EM \end{array}\right\} \Rightarrow MC \perp (EMB)$$

$$BQ \subset (EMB)$$

$$\Rightarrow MC \perp BQ \quad (2)$$

(1)

$$\left.\begin{array}{l} BQ \perp EM \\ BQ \perp MC \\ EM, MC \subset (EMC) \end{array}\right\} \Rightarrow BQ \perp (EMC)$$

$$d(B,(EMC)) = BQ$$

$$BQ = \frac{MB \cdot BE}{ME} = \frac{\cancel{5} \cdot 10}{\cancel{5}\sqrt{5}} = \frac{10\sqrt{5}}{5} = 2\sqrt{5}$$