

Solusi

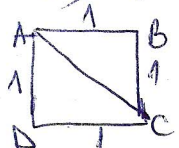
1. $a = \frac{23}{7} = 3\frac{2}{7} \Rightarrow [a] = 3; \{a\} = \frac{2}{7}; b = -35,8 \Rightarrow [b] = -36, \{b\} = 0,2$
 $c = \sqrt{136} \Rightarrow 121 \leq 136 < 144 \Rightarrow 11 \leq \sqrt{136} < 12 \Rightarrow [\sqrt{136}] = 11; \{\sqrt{136}\} = \sqrt{136} - 11$
 $d = \sqrt{n^2 + n + 1} \Rightarrow n \leq \sqrt{n^2 + n + 1} < n + 1 \Rightarrow [d] = n, \{d\} = \sqrt{n^2 + n + 1} - n.$

2. $a \geq -1, b \geq 2 \Rightarrow a + b \geq 1 \Rightarrow a + b - 1 \geq 0 \Rightarrow |a + b - 1| = a + b - 1$
 $b \geq 2 \Rightarrow 2b \geq 4 \stackrel{||\pm||}{\Rightarrow} 2b - a \geq 1 \Rightarrow |2b - a| = 2b - a$
 $a \leq b \Rightarrow -a \geq -b$
 $a \leq b \Rightarrow 3a \leq 9 \stackrel{||\pm||}{\Rightarrow} 3a - b \leq 7 \Rightarrow 3a - b - 7 \leq 0 \Rightarrow$
 $b \geq 2 \Rightarrow -b \leq -2 \Rightarrow \sqrt{(3a - b)^2} = |3a - b| = -3a + 7 + b$
 $\Rightarrow E = a + b - 1 + 2b - a - 3a + 7 + b = -3a + 4b + 6$

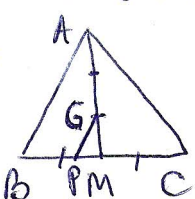
3. $\sqrt{\frac{a^2 + b^2}{2}} \geq \frac{a + b}{2} \geq \sqrt{ab} \stackrel{||\pm||}{\Rightarrow} a^2 + b^2 \geq 2ab \Rightarrow a^2 + b^2 \geq 14$
 $a + b \geq 2\sqrt{ab} \Rightarrow a + b \geq 2\sqrt{7} \Rightarrow a^2 + b^2 + 3a + 3b \geq 14 + 6\sqrt{7}$

4. $x^4 - 8x^2 - 9 = 0$, Notasi $x^2 = y \Rightarrow y^2 - 8y - 9 = 0 \Rightarrow y_1 = 9, y_2 = -1$
 $\Rightarrow x^2 = 9 \Rightarrow x_{1,2} = \pm 3$ atau $x^2 = -1$ mi are nol. reale.

5. $\Delta = 49 - 8(2m - 5) = 49 + 40 - 16m = 89 - 16m \geq 0 \Rightarrow m \leq \frac{89}{16}$
 $x_1 + x_2 = -\frac{b}{a} = \frac{7}{2}; x_1 x_2 = \frac{c}{a} = \frac{2m - 5}{2} \Rightarrow \frac{7}{2} - 3 \cdot \frac{2m - 5}{2} = 14 \Rightarrow$
 $\Rightarrow 7 - 6m + 15 = 28 \Rightarrow m = -1 \leq \frac{89}{16} \Rightarrow \boxed{m = -1}$

6.  $|\vec{AB} + \vec{AC} + \vec{AD}| = |\vec{AC} + \vec{AC}| = |2\vec{AC}| = 2 \cdot |\vec{AC}| = 2\sqrt{2}$
 $AC^2 = AB^2 + BC^2 = 1 + 1 = 2 \Rightarrow AC = \sqrt{2}$

7. $\vec{BP} = 2\vec{PD} \Rightarrow \vec{BP} = 2 \cdot (\vec{PB} + \vec{BD}) \Rightarrow \vec{BP} = -2\vec{BP} + 2\vec{BD}$
 $\Rightarrow 3\vec{BP} = 2 \cdot (\vec{BA} + \vec{AD}) \Rightarrow \vec{BP} = \frac{2}{3} (\vec{BA} + \vec{BC})$

8.  $\frac{GP}{AB} = \frac{MG}{MA} \Rightarrow \frac{GP}{AB} = \frac{1}{3} \Rightarrow \vec{GP} = \frac{1}{3} \vec{AB} \Rightarrow m = \frac{1}{3}$

9. $\vec{AM} = 3\vec{MB} \Rightarrow \vec{AM} = 3(\vec{MA} + \vec{AB}) \Rightarrow \vec{AM} = -3\vec{AM} + 3\vec{AB}$
 $\Rightarrow \vec{AM} = \frac{3}{4} \vec{AB}$
 $\vec{MN} = \vec{MA} + \vec{AN} = -\frac{3}{4} \vec{AB} + \frac{3}{4} \vec{AC} = \frac{3}{4} (-\vec{AB} + \vec{AC}) =$
 $= \frac{3}{4} (\vec{BA} + \vec{AC}) = \frac{3}{4} \vec{BC} \Rightarrow \vec{MN}, \vec{BC} \text{ colinear.}$