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Mechanical Engineering

MAT 102

1) A(6,-5), B(-2,1) and C(0,3)

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

$= \sqrt{(-2-6)^2+(1+5)^2}$

$= \sqrt{64+36}$

$= \sqrt{100} = 10$

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

$= \sqrt{(0+2)^2+(3-1)^2}$

$= \sqrt{4+4}$

$= \sqrt{8} = 2\sqrt{2}$

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

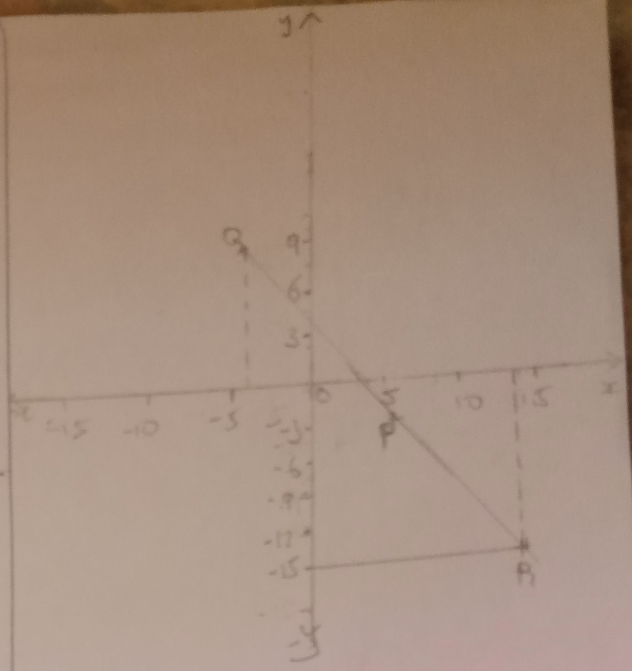
$= \sqrt{(0-6)^2+(3+5)^2}$

$= \sqrt{36+64}$

$= \sqrt{100} = 10$

Since $\overline{AB} = \overline{AC} \neq \overline{BC}$, ∴ its an isoceles triangle

2) P(5,-3), Q(-4,9), R(14,-15)




a) P divides $\overline{QR}$ internally

Using $x = \frac{lx_1 + kx_2}{l+k}$

$5 = \frac{l(-4)+k(14)}{l+k}$

$5(l+k) = -4l + 14k$

$5l + 5k = -4l + 14k$

$5l + 4l = 14k - 5k$

$9l = 9k$

Ratio $k:l \Rightarrow 1:1$

b) R divides $\overline{PQ}$ externally

Using $x = \frac{lx_1 - kx_2}{l-k}$

$14 = \frac{l(5) - k(-4)}{l-k}$

$14l - 14k = 5l + 4k$

$14l - 5l = 4k + 14k$

$9l = 18k$

Ratio $k:l \Rightarrow 2:1$