

a.) P divides \overline{QR} internally therefore,

From the graph the line \overline{QR} gives $(x, y) = (-4, 14)$

$$\text{Using } x = \frac{lx_1 + Kx_2}{1+K}$$

$$5 = \frac{l(-4) + K(14)}{1+K}$$

$$1+K$$

$$5(1+K) = -4l + 14K$$

$$9l = 9K$$

∴ Ratio $K:l = 1:1$

b.) R divides \overline{PQ} externally therefore,

From the graph the line \overline{PQ} gives $(x, y) = (5, -3)$

$$y_1 = -3, y_2 = -15, y = 9$$

$$\text{Using } y = \frac{ly_1 - Ky_2}{1-K}$$

$$9 = \frac{l(-3) - K(-15)}{1-K}$$

$$1-K$$

$$9(1-K) = -3l + 15K$$

$$9l - 9K = -3l + 15K$$

$$12l = 24K$$

∴ Ratio $K:l = 2:1$

MAT 102 Assignment

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

An Isosceles triangle is a triangle in which only 2 of its sides are equal.

$$\overline{AB} = \sqrt{(6+2)^2 + (-5-1)^2} = \sqrt{64+36} = \sqrt{100} \Rightarrow 10$$

$$\overline{AC} = \sqrt{(6-0)^2 + (-5-3)^2} = \sqrt{36+64} = \sqrt{100} \Rightarrow 10$$

$$\overline{BC} = \sqrt{(-2-0)^2 + (1-3)^2} = \sqrt{4+4} = \sqrt{8} \Rightarrow 2.$$

Since, $\overline{AB} = \overline{AC} \neq \overline{BC}$ therefore it is an Isosceles triangle.

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

$$x_1 = 5 \qquad y_1 = -3$$

$$x_2 = -4 \qquad y_2 = 9$$

$$x_3 = 14 \qquad y_3 = -15$$

