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MATH 102 ASSIGNMENT

1) A (6, -5), B (-2, -1) and C (0, 3)
An Isosceles triangle is a triangle in which only 2 of it's 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, $\overline{AB} = \overline{AC} + \overline{BC}$ Therefore It is an Isosceles triangle

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

$x_1 = 5$ $y_1 = -3$

$x_2 = -4$ $y_2 = 9$

$x_3 = 14$ $y_3 = -15$

a) P divides $\overline{OR}$ Internally therefore
From the graph the line $\overline{OR}$ gives (x, y)
x x_2
$(-4, 14)$

Using $x = \frac{lx_1 + kmx_2}{l + k}$

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

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

$9l = 9k$

$\therefore$ Ratio $k : l \Rightarrow 1 : 1$

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

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

Using $y = \frac{ly - ky_2}{l - k}$

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

$9(l - k) = -3l + 15k$

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

$12l = 24k$

$\therefore$ Ratio $k : l = 2 : 1$