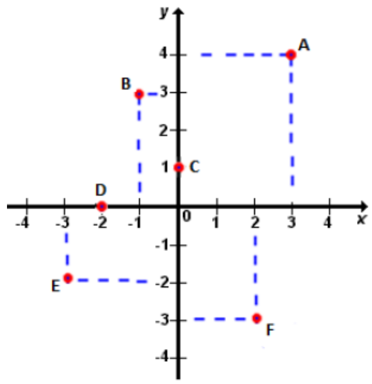
FAETEC
FUNDAÇÃO DE APOIO À ESCOLA TÉCNICA DO ESTADO DO RIO DE JANEIRO

Escola Técnica Estadual Visconde de Mauá

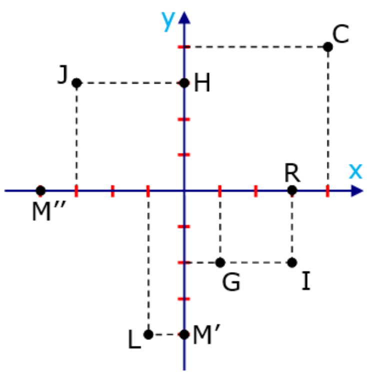
Gabarito Geometria Analítica: Ponto

1)

A(3, 4)
B(−1, 3)
C(0, 1)
D(−2, 0)
E(−3, −2)
F(2, −3)



2)



3)

A(−2, −1)

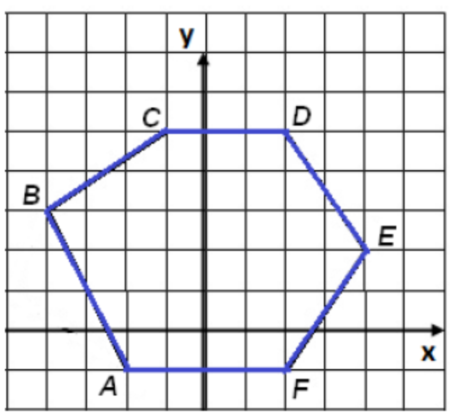
B(−4, 3)

C(−1, 5)

D(2, 5)

E(4, 2)

F(2, −1)



4)

a) $d_{AB} = \sqrt{(3-3)^2 + (5-(-1))^2} = \sqrt{(0)^2 + (6)^2} = \sqrt{36} = 6$

b) $d_{AB} = \sqrt{(1-3)^2 + (4-7)^2} = \sqrt{(-2)^2 + (-3)^2} = \sqrt{4+9} = \sqrt{13}$

5)

a)

$d_{AB} = \sqrt{(1-3)^2 + (6-1)^2} = \sqrt{4+25} = \sqrt{29}$

$d_{AC} = \sqrt{(2-3)^2 + (3-1)^2} = \sqrt{1+4} = \sqrt{5}$

$d_{BC} = \sqrt{(2-1)^2 + (3-6)^2} = \sqrt{1+9} = \sqrt{10}$

O triângulo é ESCALENO.

b)

$d_{AB} = \sqrt{(2-(-2))^2 + (0-0)^2} = \sqrt{16+0} = 4$

$d_{AC} = \sqrt{(0-(-2))^2 + (2\sqrt{3}-0)^2} = \sqrt{4+12} = 4$

$d_{BC} = \sqrt{(0-2)^2 + (2\sqrt{3}-0)^2} = \sqrt{4+12} = 4$

O triângulo é EQUILÁTERO.

6)

$d_{AB} = \sqrt{(2-4)^2 + (3-(-2))^2} = \sqrt{4+25} = \sqrt{29}$

$d_{AC} = \sqrt{(6-4)^2 + (6-(-2))^2} = \sqrt{4+64} = \sqrt{68}$

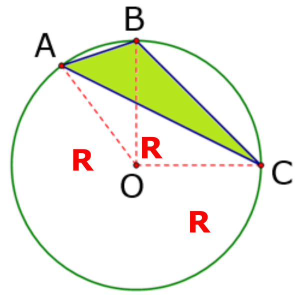
$d_{BC} = \sqrt{(6-2)^2 + (6-3)^2} = \sqrt{16+9} = \sqrt{25}$

$$\left(\sqrt{68}\right)^2 > \left(\sqrt{29}\right)^2 + \left(\sqrt{25}\right)^2 \Rightarrow \text{obtusângulo}$$

7)

Dados:

$A(0,\ 5)$
$B(3,\ 6)$
$C(8,\ 1)$
$O(x,\ y)$



$$d_{AO} = d_{BO} = d_{CO} = R$$
$$d_{AO} = d_{BO} \Rightarrow \sqrt{(x-0)^2 + (y-5)^2} = \sqrt{(x-3)^2 + (y-6)^2}$$
$$\sqrt{x^2 + y^2 - 10y + 25} = \sqrt{x^2 - 6x + 9 + y^2 - 12y + 36}$$
$$x^2 + y^2 - 10y + 25 = x^2 - 6x + 9 + y^2 - 12y + 36$$
$$-10y + 25 = -6x - 12y + 45$$
$$6x + 2y = 20 \Rightarrow 3x + y = 10$$

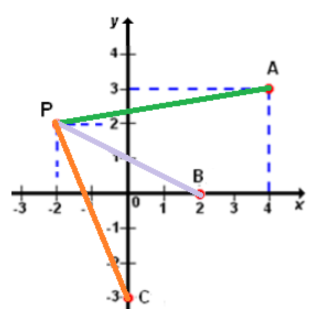
$$d_{AO} = d_{CO} \Rightarrow \sqrt{(x-0)^2 + (y-5)^2} = \sqrt{(x-8)^2 + (y-1)^2}$$
$$\sqrt{x^2 + y^2 - 10y + 25} = \sqrt{x^2 - 16x + 64 + y^2 - 2y + 1}$$
$$x^2 + y^2 - 10y + 25 = x^2 - 16x + 64 + y^2 - 2y + 1$$
$$-10y + 25 = -16x + 65 - 2y$$
$$16x - 8y = 40 \Rightarrow 2x - y = 5$$

$$\begin{cases} 3x + y = 10 \\ 2x - y = 5 \end{cases} \Rightarrow 5x = 15 \Rightarrow x = 3 \Rightarrow y = 1$$

Resposta: O(3, 1)

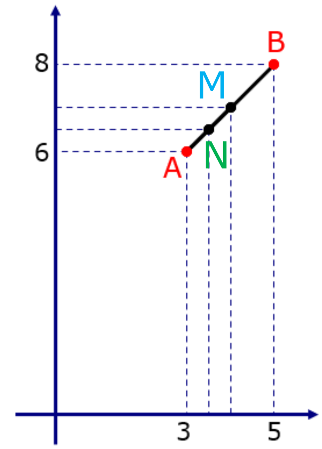
8)

$$d_{PA} = \sqrt{(4-(-2))^2 + (3-2)^2} = \sqrt{36+1} = \sqrt{37} > 6$$
$$d_{PB} = \sqrt{(2-(-2))^2 + (0-2)^2} = \sqrt{16+4} = \sqrt{20} < 5$$
$$d_{PC} = \sqrt{(0-(-2))^2 + (-3-2)^2} = \sqrt{4+25} = \sqrt{29} < 5{,}5$$



Os pontos B e C poderão acessar a internet.

9)



Como a trajetória é retilínea a constante, teremos uma proporcionalidade entre o tempo e o espaço percorrido.
Assim:

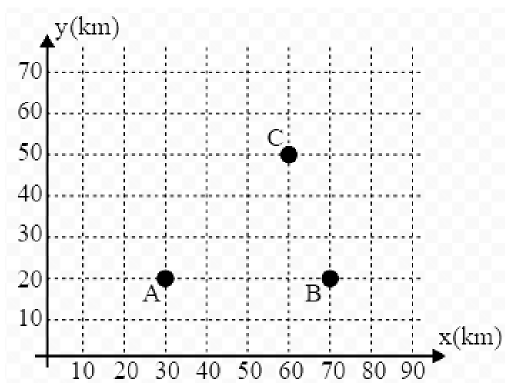
a) Em dois minutos, teremos o ponto médio do segmento AB:

$$M = \left(\frac{5+3}{2}, \frac{8+6}{2}\right) = (4, 7)$$

b) Em um minuto, a posição será o ponto médio (N) do segmento AM:

$$N = \left(\frac{4+3}{2}, \frac{7+6}{2}\right) = (3{,}5\ ;\ 6{,}5)$$

10)



$$d_{AO} = d_{BO} = d_{CO} = R$$

$$d_{AO} = d_{BO} \Rightarrow \sqrt{(x-30)^2 + (y-20)^2} = \sqrt{(x-70)^2 + (y-20)^2}$$

$$(x-30)^2 + (y-20)^2 = (x-70)^2 + (y-20)^2$$

$$(x-30)^2 = (x-70)^2$$

$$x^2 - 60x + 900 = x^2 - 140x + 4900$$

$$80x = 4000 \Rightarrow x = 50$$

$$d_{AO} = d_{CO} \Rightarrow \sqrt{(50-30)^2 + (y-20)^2} = \sqrt{(50-60)^2 + (y-50)^2}$$

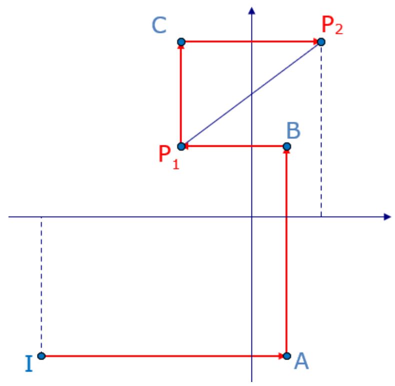
$$\sqrt{400 + (y-20)^2} = \sqrt{100 + (y-50)^2}$$

$$400 + (y-20)^2 = 100 + (y-50)^2$$

$$400 + y^2 - 40y + 400 = 100 + y^2 - 100y + 2500 \Rightarrow 60y = 1800 \Rightarrow y = 30$$

Resposta: (50, 30)

11)



Indicamos, de acordo com o enunciado, os pontos I, A, B, P_1, C e P_2 após cada deslocamento efetuado.

$$I(-6,-4) \Rightarrow A(1,-4) \Rightarrow B(1,\ 2) \Rightarrow P_1(-2,\ 2) \Rightarrow C(-2,\ 5) \Rightarrow P_2(2,\ 5)$$

$$d_{p_1p_2} = \sqrt{(2-(-2))^2 + (5-2)^2} = \sqrt{16+9} = 5$$

Opção: E