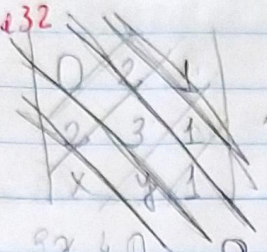
11/04/23

ATIVIDADE

Página 31 e 32

Q. 1 - a)

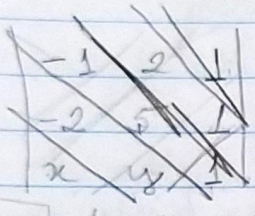


$$\begin{vmatrix} 0 & 2 & 1 \\ 2 & 3 & 1 \\ x & y & 1 \end{vmatrix} = 0$$

$$5x + 0 + 0 - 2x - 2y - 0 = 0$$

$$x - 2y + 4 = 0$$

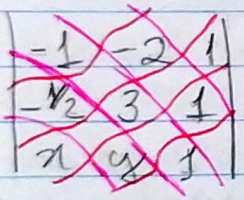
b)



$$\begin{vmatrix} -1 & 2 & 1 \\ -2 & 5 & 1 \\ x & y & 1 \end{vmatrix} = 0$$

$$5x - 4 - y + 5 - 2x + 2y = 0 \rightarrow 3x + y + 1 = 0$$

c)

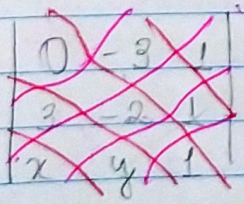


$$\begin{vmatrix} -1 & -2 & 1 \\ -\frac{1}{2} & 3 & 1 \\ x & y & 1 \end{vmatrix} = 0$$

$$3x - y + 1 + 3 + 2x + \frac{1}{2}y = 0$$

$$5x - \frac{1}{2}y + 4 = 0$$

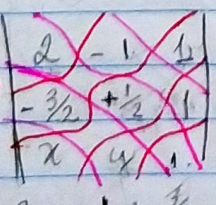
d)



$$\begin{vmatrix} 0 & -3 & 1 \\ 2 & -2 & 1 \\ x & y & 1 \end{vmatrix} = 0$$

$$0 + 3y - 3x + 2x + 9 + 0y + -x + 3y + 9 = 0$$

Questão 5 - a)



$$\begin{vmatrix} 2 & -1 & \frac{1}{2} \\ -\frac{3}{2} & +\frac{1}{2} & 1 \\ x & y & 1 \end{vmatrix} = 0$$

$$\frac{1}{2}x + \frac{3}{2} + 2y - 1 + \frac{3}{2}y + x = 0$$

$$+\frac{3}{2}x + \frac{1}{2} + \frac{7}{2}y = 0$$

$$3x + 1 + 7y = 0$$

$$\frac{x_b + x_c}{2} \qquad \frac{y_b + y_c}{2}$$

$$\frac{(0-3)}{2} \qquad \frac{(-1+2)}{2}$$

$$x\left(-\frac{3}{2}\right) \qquad y\left(+\frac{1}{2}\right)$$

b) $3x + 7y + 1 = 0$

$3.0 + 7.0 + 1 = 1 \neq 0$ Logo, s não passa pela origem

$2.(-7) + 7.(3) + 1 = 0$

$-21 + 21 + 1 - 1 \neq 0$ Logo, s não passa por $(-7, 3)$

Q.7. $y = 5$, $\boxed{y - 5 = 0}$

Q.9. s: $x = -1$, $\boxed{x + 1 = 0}$

r: $y = 4$, $\boxed{y - 4 = 0}$

t:

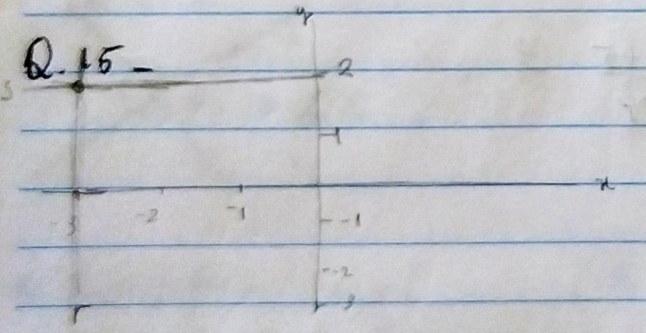
0	0	1
-1	4	1
x	y	1

$= 0$

$0 + 0x - y - 4x + 0 + 0 = 0 \rightarrow -4x - y = 0$

$\sqrt{(x_A - x_B)^2 + (y_A - y_B)^2}$

Q.15 -



a) $P = (-3, 2)$

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

$\sqrt{9 + 4} = \sqrt{13}$

Q.17 - $2.\frac{1}{2} - 0 - K = 0$

$1 - K = 0 \rightarrow \boxed{K = 1}$

$2.x + y - 1 = 2.\frac{1}{2} + 0 - 1 = 0$

Páginas 39 e 40 Q.27, 31 e 35

Q.27 - a) $\frac{y_B - y_A}{x_B - x_A} = \frac{+2 - 1}{0 - 3} = \frac{-3}{3} = -1$ $\quad tg\,\theta = 1$, $\theta = 45°$

(2, 1) (0, 0)

b) $\frac{y_B - y_A}{x_B - x_A} = \frac{2 - 0}{1 - 0} = 2$ $\quad tg = ?$

c) Reta horizontal, $\theta = 0°$

Q. 31 - a) $2y = x + 6 \Rightarrow y = 1/2\,x + 3 \Rightarrow \boxed{m = 1/2}$

b) $\boxed{m = -1/3}$

c) $m = \frac{\Delta y}{\Delta x} = \frac{4-0}{-5+3} = \frac{4}{-2} = \boxed{-2}$

d) $m = \frac{\Delta y}{\Delta x} = \frac{-4-5}{1-1} = \nexists$

e) $m = \frac{\Delta y}{\Delta x} = \frac{5-5}{3-(-2)} = \frac{0}{5} = 0$

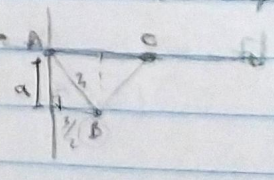
f) $P_M = \frac{-1+3}{2} = 1 \Rightarrow x \quad \frac{1+5}{2} = 3 \Rightarrow y$

$\frac{3-0}{1-0} = 3 \Rightarrow \boxed{m = 3}$

Q. 35 - Equação da Reta = 2 Pontos de cada reta ou 1 ponto e 1 coeficiente

$\boxed{\overleftrightarrow{AC}: y = 0}$

$A(0,0)$ e $B\left(\frac{3}{2}, \frac{3\sqrt{3}}{2}\right)$



$3^2 = (3/2)^2 + a^2$

$9 = (9/4) + a^2$

$\frac{9(-9)}{1 \times 4} = a^2$ $\quad 9 \times 4 = 36 - 9 = 27$

$\frac{27}{4} = a^2$

$\sqrt{\frac{27}{4}} = a$

$\frac{3\sqrt{3}}{2} = a$

$m = \frac{0 - \left(-\frac{3\sqrt{3}}{2}\right)}{0 - 3/2} = \frac{\frac{3\sqrt{3}}{2}}{-\frac{3}{2}}$

$m = \frac{3\sqrt{3}}{2} \cdot \left(-\frac{2}{3}\right) = \boxed{-\sqrt{3}}$

$x = 0 \quad y = mx + n$

$\boxed{\overleftrightarrow{AB}: y = -\sqrt{3}x}$

$B\left(\frac{3}{2}, \frac{3\sqrt{3}}{2}\right)$ $C = (3, 0)$

$m = \frac{0 - \left(\frac{3\sqrt{3}}{2}\right)}{3 - \frac{3}{2}} = \frac{\frac{3\sqrt{3}}{2}}{\frac{3}{2}} = \frac{3\sqrt{3}}{2} \cdot \frac{2}{3} = \sqrt{3}$

$y = mx + n$

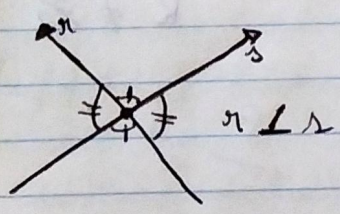
$0 = \sqrt{3} \cdot 3 + n$

$-3\sqrt{3} = n$

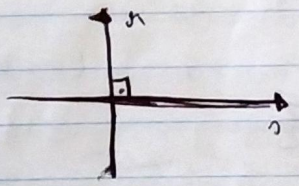
Posições relativas entre retas no plano

* Concorrentes:

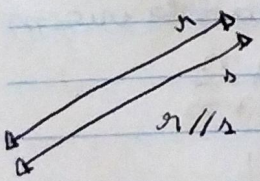
↳ Oblíqua:



↳ Perpendiculares:



* Paralelas



↓

$r: y = m_1 x + n_1$

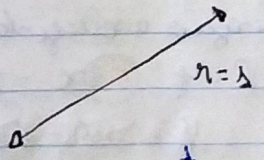
$s: y = m_2 x + n_2$

$r // s \Rightarrow m_1 = m_2$

$n_1 \neq n_2$

↳ Paralela - não coincidentes

* Coincidentes



↓

$m_1 = m_2$

$n_1 = n_2$

Ex: $r: y = \frac{1x}{2} + 3$

$s: y = \frac{1x}{2} - 5$

$m_1 = m_2$

$n_1 \neq n_2$

Reta Paralela

Exercícios Resolvidos:

6- $r: y = 2x - 1$ $\quad P(1,4)$ $\quad$ Se $r \parallel s$ então $m_s = 2$

$s: y = m_s x + n$

$y = mx + n \rightarrow 4 = 2 \cdot 1 + n$

$4 = 2 + n$

$4 - 2 = n \rightarrow \boxed{n = 2}$

$\boxed{y = 2x + 2}$

7- $s: 3x - 2y + 5 = 0$

$s: Kx - y + 1 = 0$

(r) $\rightarrow -2y = -3x - 5 \cdot (-1)$

$2y = 3x + 5$

$y = \frac{3x+5}{2}$

$y = \frac{3x}{2} + \frac{5}{2}$

(s) $\rightarrow -y = -Kx - 1 \cdot (-1)$

$y = Kx + 1$

$K \neq \frac{3}{2}$

Resolvendo....

48 - Qual é a equação reduzida da reta que passa pela origem e é paralela a $r: y = -3x - 2$?

$y = -3x + 0 + n$ $\quad y = -3x + n$

$0 = -3 \cdot 0 + n$

$\boxed{0 = n}$

10 - $m = \frac{2+0}{2} = 1 \; ; \; \frac{3+0}{2} = \frac{3}{2}$

$m = \frac{3-0}{2-0} = \frac{3}{2} \rightarrow \boxed{-\frac{2}{3}}$ $\quad y = -\frac{2}{3}x + n \rightarrow \frac{3}{2} = -\frac{2}{3} \cdot 1 + n$

$\boxed{y = -\frac{2}{3}x + \frac{13}{6}}$

$3/2 + 2/3 = n$

$\frac{9+4}{6} = n \rightarrow \boxed{n = 13/6}$

* Prova: Concorrente, coincidente → d = 0
Paralela → tem q calcular [d]

Exercício Resolvido – Distância entre o Ponto e a Reta

13. $\begin{vmatrix} x & y & 1 \\ -2 & -4 & 1 \\ 1 & -2 & 1 \end{vmatrix} = 0 \rightarrow -4x + 4 + y + 4 + 2y + 2x = 0$

$\overrightarrow{AB}: -2x + 3y + 8 = 0$

$d_{\overrightarrow{ABC}} = \frac{|-2.2 + 3.5 + 8|}{\sqrt{(-2)^2 + 3^2}} = \frac{|-4 + 15 + 8|}{\sqrt{4+9}} = \frac{|19|}{\sqrt{13}} = \frac{19\sqrt{13}}{13}$

* 14. $r: x + 2y + 5 = 0$ $\quad s: x + 2y - 3 = 0$

$2y = -x - 5$ $\quad 2y = -x + 3$

$y = \frac{(-1)}{2}x - \frac{5}{2}$ $\quad y = \frac{(-1)}{2}x + \frac{3}{2}$ retas Paralelas

Definindo um ponto de r

P / x = 3 → escolher ímpar fica mais fácil quando soma com 5 e ÷2.

$y = \frac{-3}{2} - \frac{5}{2} = \frac{-8}{2} = -4$ $\quad (3, -4)$

Calcular a dist. entre (3, -4) e a reta s.

$d = \frac{|3 + 2.(-4) - 3|}{\sqrt{1^2 + 2^2}} = \frac{|3 - 8 - 3|}{\sqrt{1+4}} = \frac{|-8|}{\sqrt{5}} = \frac{8.\sqrt{5}}{\sqrt{5}} = \frac{8\sqrt{5}}{5}$ u.c.

Corrigindo...

61 – P(2, 3)

a) $r: y = 3x - 1$

$m_r = 3$ $\quad m_s = -\frac{1}{3}$

$y = mx + n$

$-3 = -\frac{1}{3}.2 + n$

$-3 = -\frac{2}{3} + n$

$-3 + \frac{2}{3} = n$

$-\frac{9}{3} + \frac{2}{3} = n$

$\boxed{-\frac{7}{3} = n}$

b) $2x - 5y - 11 = 0$

$2x - 11 = 5y$

$\frac{2x}{5} - \frac{11}{5} = y$ $\}\ m_1 = \frac{2}{5}$ $\quad P = (-2, 3)$

$m_2 = \frac{-5}{2}$

$y = mx + n$

$-3 = \frac{-5}{2}.(-2) + n$

$-3 + 5 = n$ $\quad \boxed{y = \frac{5}{2}x + 2}$

$n = 2$

Resolvendo...

84 a) $P(-1, -3)$ e $r: 3x - y + 5 = 0$

$d = \frac{|3.(-1) - 1.(-3) + 5|}{\sqrt{3^2 + (-1)^2}} \cdot \frac{|-3 + 3 + 5|}{\sqrt{9+1}} = \frac{5}{\sqrt{10}} \cdot \frac{\sqrt{10}}{10} = \frac{5\sqrt{10}}{10} = \frac{\sqrt{10}}{2}$

d) $P(1, -1)$ $r: 3x - y - 4$

$d = \frac{|3.1 - 1.(-1) - 4|}{\sqrt{3^2 + (-1)^2}} = \frac{|3 + 1 - 4|}{\sqrt{10}} = 0$ $\quad \boxed{P \in r}$

85 - $\begin{vmatrix} x & y & 1 \\ -1 & -1 & 1 \\ 4 & -10 & 1 \end{vmatrix} = -x + 4y + 10 + 4 + y + 10x = 0$

$\overrightarrow{AC} = 9x + 5y + 14$

$d_{AC} = \frac{|9.6 + 5.(-3) + 14|}{\sqrt{9^2 + 5^2}} = \frac{|54 - 15 + 14|}{\sqrt{81 + 25}} = \frac{53}{\sqrt{106}} = \frac{53\sqrt{106}}{106} = \frac{\sqrt{106}}{2}$

P/ x = 2

$8 - y = 3x - 1 \Rightarrow 3 \cdot 2 - 1$

$y = 5$

$y = 5$

40 | 2 | $= 2^2$
20 | 2 |
10 | 2 |
5 | 5 | 10
1 |

$d = \frac{|6x - 2y + 15|}{\sqrt{a^2 + b^2}}$

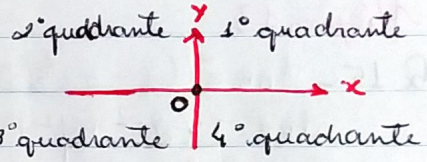
$d = \frac{|6 \cdot 2 - 2 \cdot 5 + 15|}{\sqrt{6^2 + (-2)^2}}$

$d = \frac{|12 - 10 + 15|}{\sqrt{36 + 4}} \cdot \frac{17}{\sqrt{40}} = \frac{17}{2\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}}$

$\frac{17 \cdot \sqrt{10}}{2 \cdot 10} = \boxed{\frac{17\sqrt{10}}{20}}$

Revisão: Geometria Analítica

→ Plano Cartesiano



- Eixo x (x, 0): Eixo das abcissas
- Eixo y (0, y): Eixo das ordenadas

* um ponto pertence à bissetriz dos quadrantes ímpares (b_{13}) se suas coordenadas são iguais. Ex.: (3, 3) pertence a bissetriz b_{13}.
* um ponto pertence à bissetriz dos quadrantes pares (b_{24}) se suas coordenadas são opostas. Ex.: O ponto (-3, 3) pertence a bissetriz b_{24}.

Colocando em práticas...

Página 10

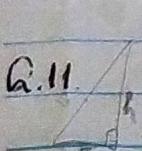
Q.5 - $x = k^2 - 9 \circ x = 0$

$k^2 - 9 = 0 \Rightarrow k^2 = 9 \circ k = \pm\sqrt{9} \Rightarrow k = \pm 3$

Q.7 - A = (3, 0); B = (0, 3); C = (-3, 0); D = (0, -3);
E = (5, 0), F = (0, 5), G = (-5, 0); H = (0, -5).

72 | 2
36 | 2 | 2
18 | 2
9 | 3
3 | 3 | 3
1

Q.11



$13^2 = 5^2 + h^2$

$169 - 25 = h^2$

$h^2 = 144 \Rightarrow h = 12$

Q.13 - $a^2 = 6^2 + 6^2$

$a^2 = 72 \Rightarrow 9 \cdot 6\sqrt{2}$

A = $(-3\sqrt{2}, 0)$

B = $(0, 3\sqrt{2})$

C = $(3\sqrt{2}, 0)$ D = $(0, -3\sqrt{2})$

Distância entre dois pontos

1° caso: O segmento $\overline{AB}$ é paralelo ao eixo x.

$$d_{AB} = |x_A - x_B|$$

2° caso: O segmento $\overline{AB}$ é paralelo ao eixo y.

$$d_{AB} = |y_A - y_B|$$

3° caso: O segmento $\overline{AB}$ não é paralelo a qualquer um dos eixos coordenados.

$$d_{AB} = \sqrt{(x_A - x_B)^2 + (y_A - y_B)^2} \quad \text{ou} \quad d_{AB} = \sqrt{(\Delta x)^2 + (\Delta y)^2}$$

Colocando em prática...

Página 13

Q. 15 - $d_{AB} = \sqrt{(1-3)^2 + (0-7)^2}$

$d_{AB} = \sqrt{(-2)^2 + (-7)^2}$

$d_{AB} = \sqrt{4 + 49} = \sqrt{53}$

$d_{AC} = \sqrt{(-2-1)^2 + (4-0)^2}$

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

$d_{AC} = \sqrt{9 + 16} \rightarrow d_{AC} = \sqrt{25} \rightarrow d_{AC} = 5$

$d_{BC} = \sqrt{[3-(-2)]^2 + (7-4)^2}$

$d_{BC} = \sqrt{5^2 + 3^2} \rightarrow d_{BC} = \sqrt{25+9} = \sqrt{34}$

Perímetro é $(5 + \sqrt{34} + \sqrt{53})$ u.c.

Q. 18 - $13 = \sqrt{(3m+1-m)^2 + (5-3)^2}$

$13 = \sqrt{(2m+1)^2 + (2)^2}$

$13 = \sqrt{(4m^2 + 2 \cdot 2m \cdot 1 + 1^2) + 144}$

$13 = \sqrt{4m^2 + 4m + 1 + 144}$

$13^2 = 4m^2 + 4m + 145$

$4m^2 + 4m + 145 = 169$

$4m^2 + 4m + 145 - 169 = 0$

$4m^2 + 4m - 24 = 0 \div 4$

$m^2 + m - 6 = 0$

$\Delta = 1^2 - 4 \cdot 1 \cdot (-6)$

$\Delta = 1 + 24 \rightarrow \Delta = 25$

$m = \frac{-1 \pm \sqrt{25}}{2 \cdot 1}$

$m_1 = \frac{-1-5}{2} = \frac{-6}{2} = -3$

$m_2 = \frac{-1+5}{2} = \frac{4}{2} = 2$

m é 2° quadrante $\rightarrow m < 0 \rightarrow \boxed{m = -3}$

Q.19 - A(3,3); B(-4,2); C(-2,-2); D(4,-4)

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

$d_{AB} = \sqrt{(-7)^2 + (-1)^2}$

$d_{AB} = \sqrt{49+1} \Rightarrow d_{AB} = \sqrt{50}$

$d_{AD} = \sqrt{(4-3)^2 + (-4-3)^2}$

$d_{AD} = \sqrt{1^2 + (-7)^2}$

$d_{AD} = \sqrt{1+49} = \sqrt{50} = 5\sqrt{2}$

$d_{BC} = \sqrt{[-4-(-2)]^2 + [2-(-2)]^2}$

$d_{BC} = \sqrt{2^2 + 4^2}$

$d_{BC} = \sqrt{4+16} \Rightarrow d_{BC} = \sqrt{20} \Rightarrow d_{BC} = 2\sqrt{5}$

$d_{CD} = \sqrt{[4-(-2)]^2 + [-4-(-2)]^2}$

$d_{CD} = \sqrt{6^2 + (-2)^2}$

$d_{CD} = \sqrt{36+4} \Rightarrow d_{CD} = \sqrt{40} \Rightarrow d_{CD} = 2\sqrt{10}$

Perímetro: $5\sqrt{2} + 5\sqrt{2} + 2\sqrt{5} + 2\sqrt{10} = 10\sqrt{2} + 2\sqrt{5} + 2\sqrt{10}$

Q.21 - $d_{AB} = \sqrt{(2-5)^2 + (4-1)^2}$

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

$d_{AB} = \sqrt{9+9} = \sqrt{18} = 3\sqrt{2}$

$d_{AC} = \sqrt{(6-2)^2 + (5-4)^2}$

$d_{AC} = \sqrt{4^2 + 1^2}$

$d_{AC} = \sqrt{16+1} = \sqrt{17}$

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

$d_{BC} = \sqrt{1^2 + 4^2} = \sqrt{17}$

O triângulo possui 2 lados iguais ($\overline{AC}$ e $\overline{BC}$), logo é isósceles

Perímetro = $3\sqrt{2} + \sqrt{17} + \sqrt{17} = (3\sqrt{2} + 2\sqrt{17})$ u.c.

Q.23. $d_{PA} = d_{PB}$

$\sqrt{(-1-0)^2 + (1-y)^2} = \sqrt{(4-0)^2 + (2-y)^2}$

$(-1)^2 + 1^2 - 2.1.y + y^2 = 4^2 + 4 - 2.2.y + y^2$

$2 - 2y = 20 - 4y + 2y = 18 \Rightarrow y = 9$

P = (0, 9)

Q.25. $d_{PA} = d_{PB}$

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

$1 - 2.1.x + x^2 + (1)^2 = 4 - 2.2.x + x^2 + (3)^2$

$2 - 2x = 13 - 4x \Rightarrow 2x = 11 \Rightarrow x = 11/2$ P = (11/2, 0)

Q.27 - $d_{MA} = d_{MP} = d_{NP}$

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

$4 + 4 = 4 + y^2 \Rightarrow y^2 = 4 \Rightarrow y = \sqrt{4} \Rightarrow y = 2$

Q.28. $\sqrt{(x+2)^2+(y-4)^2} = \sqrt{(x-3)^2+(y-1)^2}$

$x^2+2.2.x+2^2+y^2-2.4.y+4^2 = x^2-2.3.x+3^2+y^2-2.1.y+1^2$

$4x+4-8y+16 = -6x+9-2y+1$

$6x+4x+20-10-8y+2y=0$

$+10x-6y+10=0 \div 2 \Rightarrow 5x-3y+5=0$

$5.2-3.x+5=0$ $\quad$ $5.5-3.y+5=0$ $\quad$ $5.1-3.y+5=0$

$15=3x$, $\boxed{x=5}$ $\quad$ $30=3y$, $y=10$ $\quad$ $10=3y$, $y=10/3$

$P.(2,5)$ $\quad$ $P=(5,10)$ $\quad$ $P=(1, 10/3)$

→ Ponto Médio de um segmento

$$M\left(\frac{x_A+x_B}{2}, \frac{y_A+y_B}{2}\right)$$

→ Baricentro

$$G\left(\frac{x_A+x_B+x_C}{3}, \frac{y_A+y_B+y_C}{3}\right)$$

Colocando em prática...

Página 17

Q.29 - a) $M_{AB}\left(\frac{1+2}{2}, \frac{2+4}{2}\right) \rightarrow M_{AB}=\left(\frac{3}{2}, 3\right)$

c) $M_{EF}\left(\frac{-1+(-3)}{2}, \frac{-\frac{1}{2}+\frac{3}{2}}{2}\right) \rightarrow \left(-2, \frac{+1}{2}\right)$

Q.31 - $\frac{2-2}{2}=0$ $\quad$ $\frac{-4+1}{2}=3/2$ $\quad$ $M_{AB}=(0, 3/2)$

$\frac{-4+2}{2}=-1$; $\frac{5-4}{2}=\frac{1}{2}$ $\quad$ $M_{BC}=(-1, 1/2)$

$\frac{-4-2}{2}=-3$; $\frac{5+1}{2}=3$ $\quad$ $M_{AC}=(-3, 3)$

$d_{AC}=\sqrt{(2+3)^2+(-4-3)^2}$ $\quad$ $d_{AC}=\sqrt{5^2+(-7)^2}$

$d_{AC}=\sqrt{25+49}=\sqrt{74}$

74 | 2

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Q.35. a) $G\left(\frac{2+4+(-2)}{3}=\frac{4}{3}\ ;\ \frac{-1-3-5}{3}=-3\right)$ $G\left(\frac{4}{3}, -3\right)$

→ Equação geral da reta

$r: ax + by + c = 0$

→ Se os pontos estiverem alinhados, devemos ter $D=0$, isto é:

$$\begin{vmatrix} x & y & 1 \\ x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \end{vmatrix} = 0$$

→ Coeficiente Angular

$$m = \frac{y_B - y_A}{x_B - x_A}$$

→ Equação reduzida de uma reta

$y = mx + n$ (m: coeficiente angular; n: onde corta Y)

→ Perpendicularidade

Se r e s são perpendiculares entre si, então $m_r \cdot m_s = -1$

$M_r = \frac{-1}{M_s}$; ou seja, o M de uma é igual ao inverso do outro M com sinal trocado

→ Distância entre ponto e reta

$$d = \frac{|a \cdot x + b \cdot y + c|}{\sqrt{a^2 + b^2}}$$

Colocando em Prática...
Páginas 31, 32 e 33
Q.05. $\frac{-3+0}{2}=\frac{-3}{2}$; $\frac{-1+0}{2}=\frac{-1}{2}$

$$\begin{vmatrix} 2 & -1 & 1 \\ -3/2 & 1/2 & 1 \\ x & y & 1 \end{vmatrix}$$

$1 - x - \frac{3}{2}y - \frac{1}{2}x - \frac{9}{2} - 2y = 0$

$-\frac{3}{2}x - \frac{1}{2}y - \frac{7}{2} = 0 \quad \times -2$

a) $+3x + 7y + 1 = 0$

b) $3.0 + 7.0 + 1 = 1 \neq 0$ logo, não passa pela origem

$3.(-7) + 7.3 + 1 = 1 \neq 0$ logo, a reta não passa pelo ponto $(-7, 3)$.

Q.15 a) $x = -3$, $y = +2$

b) $d_{PQ} = \sqrt{(-3-0)^2 + (2-0)^2} = \sqrt{(-3)^2 + 2^2} = \sqrt{9+4} = \sqrt{13}$

Q.17 $2 \cdot 0,5 - 0 - K = 0$

$1 - K = 0 \rightarrow \boxed{K = +1}$

Páginas 39 e 40

Q 30. a) $m = \frac{5-2}{2-1} = \frac{3}{1}$ $\quad y = mx + n \rightarrow n = 2 - 3$ $\quad \boxed{y = 3x - 1}$

$2 = 3 \cdot 1 + n$ $\quad \boxed{n = -1}$

b) $m = \frac{2-1}{-1-(-2)} = \frac{1}{1}$ $\quad y = mx + n \rightarrow n = 2 + 1$ $\quad \boxed{y = x + 3}$

$2 = 1 \cdot (-1) + n$ $\quad \boxed{n = 3}$

d) $m = \frac{-2-(-3)}{-3-2} = \frac{1}{-5}$ $\quad y = -\frac{1}{5}x + n \rightarrow -2 = \frac{3}{5} + n \rightarrow n = -\frac{10+3}{5}$

$-2 = -\frac{1}{5} \cdot (-3) + n$ $\quad n = -2 - \frac{3}{5}$ $\quad n = -\frac{13}{5}$

$\boxed{y = -\frac{1}{5}x - \frac{13}{5}}$

Q.31 a) $2y = x + 6 \div 2$

$y = \frac{1}{2}x + 3$

b) $m = -\frac{1}{3}$

c) $m = \frac{4-0}{-5+3} = \frac{4}{-2} = \boxed{-2}$

d) $\frac{-1+3}{2} = 1$; $\frac{1+5}{2} = 3$ $\quad m = \frac{3-0}{1-0} = 3$

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Q.47. a) $y = 4x - 1$; $2y = 8x + 1 \rightarrow y = 4x + \frac{1}{2}$ → Paralelas não coincidentes

b) $y = 5x + 6$; $y = -6x + 5$ → Concorrentes

c) $\boxed{y = -\frac{3x}{2} + 2}$; $4y = -6x + 8 \rightarrow y = \frac{-6x}{4} + \frac{8}{4} \rightarrow \boxed{y = -\frac{3x}{2} + 2}$

→ Coincidentes.

d) $y = -\frac{3x}{4} - \frac{1}{4}$; $8y = -6x + 4 \Rightarrow y = \frac{-6x}{8:2} + \frac{4:4}{8:4}$ $\Rightarrow \boxed{y = \frac{3x}{4} + \frac{1}{2}}$

Paralelas mas não coincidentes

Q.49. $2y = -3x + 1 \Rightarrow y = -\frac{3x}{2} + \frac{1}{2}$; $3y = Kx + 2 \Rightarrow y = \frac{Kx}{3} + \frac{2}{3}$

a) $-\frac{3}{2} = \frac{K}{3} \Rightarrow \boxed{K = -\frac{9}{2}}$ b) $K \neq -\frac{9}{2}$

c) Não podem ser coincidentes pois $\frac{1}{2} \neq \frac{2}{3}$.

Q.51. a) $y = 2x - 1$; $Ky = -6x - 4$; $y = \frac{-6x}{K} - 4$

$\frac{-6}{K} = 2 \Rightarrow K = -\frac{6}{2} \Rightarrow \boxed{K = -3}$

b) $y = 2x + K$, $y = Kx + 1$, $\boxed{K = 2}$

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Q.61 a) $y = \underset{m_1}{3}x - 1$ e $y = \underset{m_2}{-\frac{1}{3}x}$

$y - y_1 = m'(x - x_1)$

$y - (-3) = (-1/3)(x - 2)$

$y + 3 = -\frac{1}{3}x + \frac{2}{3}$

$y = -\frac{1}{3}x + \frac{2}{3} - \frac{9}{3}$

$\boxed{y = -\frac{1}{3}x - \frac{7}{3}}$

b) $5y = 2x - 11 \Rightarrow y = \frac{2}{5}x - \frac{11}{5}$ $m_2 = -\frac{5}{2}$

$y - y_1 = m' \cdot (x - x_1)$

$y - (-3) = -\frac{5}{2} \cdot (x - 2)$

$y + 3 = -\frac{5}{2}x + 5$

$y = -\frac{5}{2}x + 5 - 3$

$\boxed{y = -\frac{5}{2}x + 2}$

Q.63 a) $3y = x \Rightarrow y = \frac{1x}{3}$ $\Rightarrow m_1 = \frac{1}{3}$, $m_2 = 3$ } Concorrentes e perpendiculares

b) $y = 2x + 1 \Rightarrow m_1 = 2$, $m_2 = -\frac{1}{2}$ } Perpendiculares

c) $x = 0$ em ambas $\Rightarrow$ logo são paralelas ao eixo Y

d) $r: y = 0$ $s: x = 0$, $r \perp s$

e) $3y = 2x + 4 \Rightarrow y = \frac{2}{3}x + \frac{4}{3}$, $m_1 = m_2$ logo $r \parallel s$

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Q.84 - a) $d = \frac{|3.1 - (-1) + 5|}{\sqrt{3^2 + (-1)^2}} \Rightarrow d = \frac{3 + 1 + 5}{\sqrt{10}} = \frac{5}{\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}} = \frac{5\sqrt{10}}{10} = \frac{\sqrt{10}}{2}$

b) $d = \frac{|3.1 - (-1) - 4|}{\sqrt{3^2 + (-1)^2}} = \frac{3 + 1 - 4}{\sqrt{10}} = \frac{0}{\sqrt{10}} = 0$. Per

Q.85 - $\begin{vmatrix} -1 & -1 & 1 \\ 4 & -10 & 1 \\ x & y & 1 \end{vmatrix} = 0$ $\quad \overrightarrow{AC} = 9x + 5y + 14$

$d = \frac{|9.6 + 5.(-3) + 14|}{\sqrt{9^2 + (-3)^2}} = \frac{53}{\sqrt{106}} = \frac{53\sqrt{106}}{106} = \frac{\sqrt{106}}{2}$

Q.86 - $Y = 3x - 1$. P/ $x = 2 \Rightarrow Y = 3.2 - 1 \Rightarrow Y = 5$

$d = \frac{|6.2 - 2.5 + 15|}{\sqrt{6^2 + (-2)^2}} = \frac{|12 - 10 + 15|}{\sqrt{40}} = \frac{17}{2\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}} = \frac{17\sqrt{10}}{2.10} = \boxed{\frac{17\sqrt{10}}{20}}$