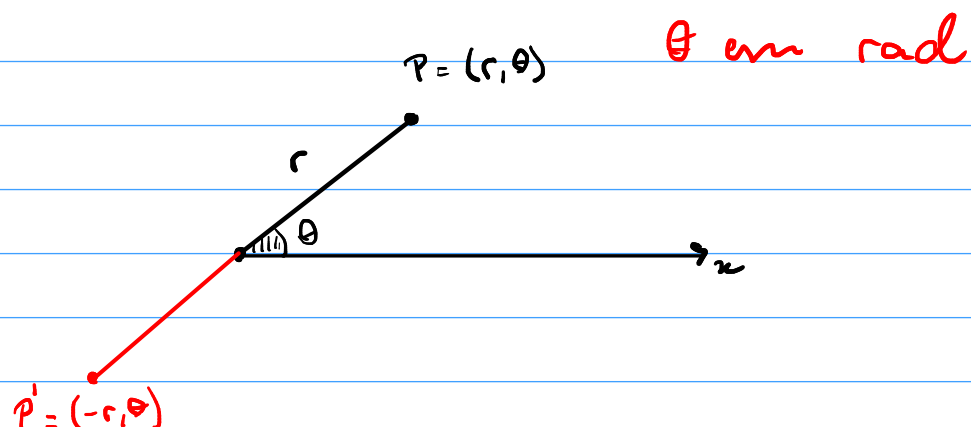
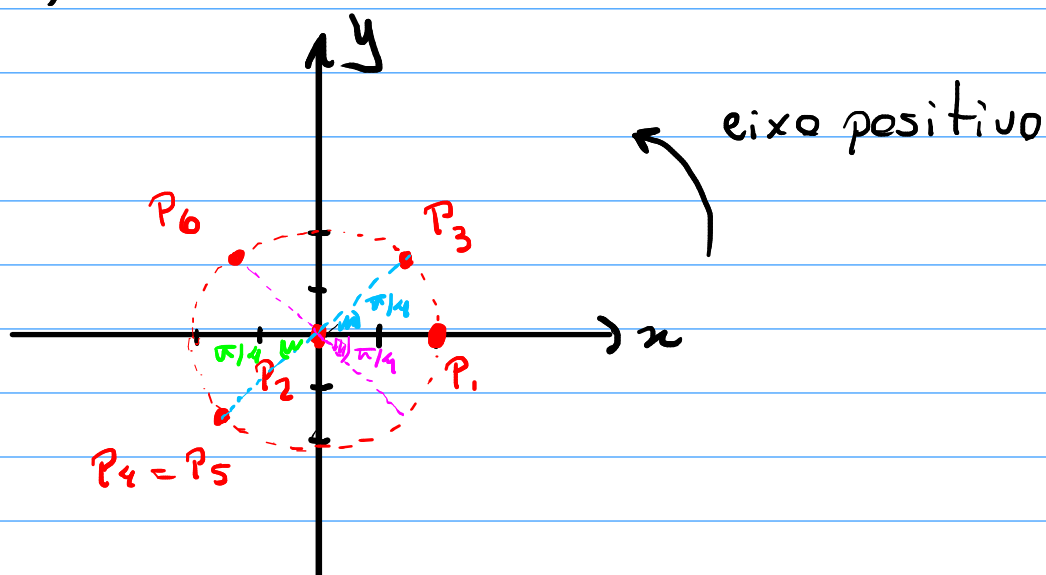


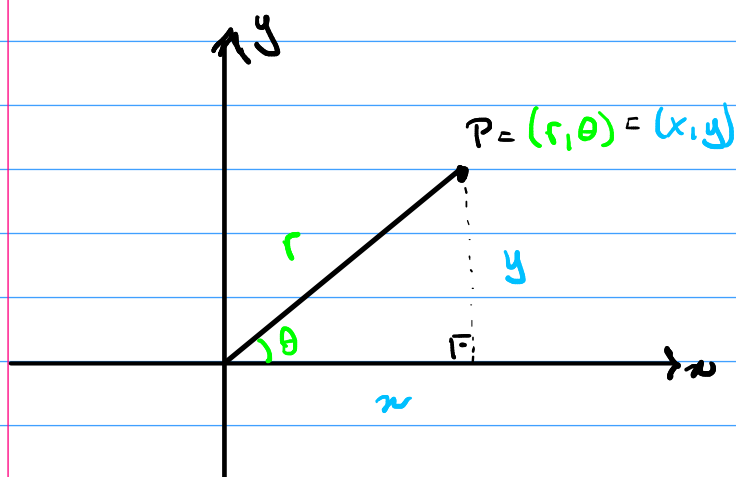
COORDENADAS POLARES



Represente no plano os pontos a seguir dados em coordenadas polares:

$P_1 = (2, 0)$; $P_2 = (0, 2)$; $P_3 = (2, \pi/4)$; $P_4 = (2, 5\pi/4)$; $P_5 = (-2, \pi/4)$;
 $P_6 = (-2, -\pi/4)$





$$\begin{cases} x = r \cos \theta \\ y = r \sin \theta \end{cases}$$

$$\begin{cases} r^2 = x^2 + y^2 \\ \tan \theta = y/x \end{cases}$$

Ver quadrante

1) Escreva em cartesianas os pontos em polares:

a) $(2, 0) = (2 \cos 0, 2 \sin 0) = (2, 0)$

b) $(-3, 0) = (-3 \cos 0, -3 \sin 0) = (-3, 0)$

c) $(3, \pi/4) = (3 \cos \pi/4, 3 \sin \pi/4) = (3\sqrt{2}/2, 3\sqrt{2}/2)$

d) $(-3, -\pi/4) = (-3 \cos(-\pi/4), -3 \sin(-\pi/4)) = (-3\sqrt{2}/2, 3\sqrt{2}/2)$

2) Escreva em polares as pontos em cartesianas

a) $(2, 0) = (2, 0)$

b) $(-1/2, \sqrt{3}/2) = (1, 2\pi/3)$

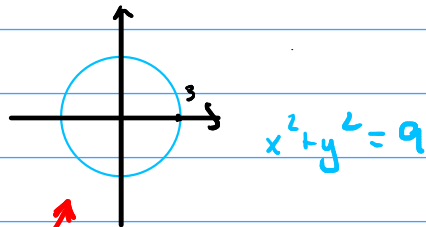
c) $(2, -2) = (2\sqrt{2}, -\pi/4)$

d) $(-1, -1) = (\sqrt{2}, 5\pi/4)$

CURVAS POLARES

$$r = f(\theta) \quad \text{ou} \quad F(r, \theta) = 0$$

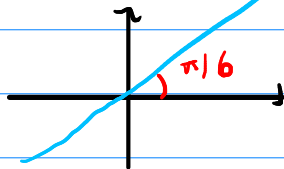
ex 1: $r = 3 \Rightarrow$



ex 2: $r = -3 \Rightarrow$

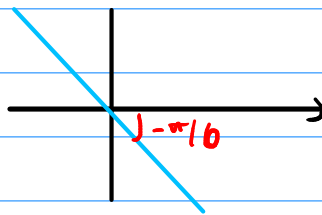


ex 3: $\theta = \pi/6 \Rightarrow$



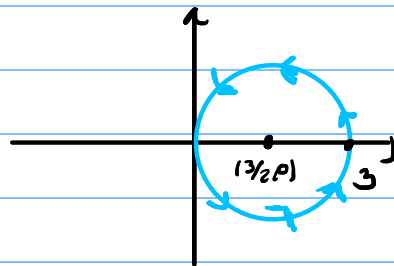
$$y = \frac{\sqrt{3}}{3}x$$

ex 4: $\theta = -\pi/6 \Rightarrow$



$$y = -\frac{\sqrt{3}}{3}x$$

ex 5: $r = 3\cos\theta \Rightarrow$



$$r^2 = 3r\cos\theta$$

$$x^2 + y^2 = 3r\cos\theta$$

$$x^2 + y^2 = 3x$$

$$x^2 - 3x + 9/4 + y^2 = 9/4$$

$$(x - 3/2)^2 + y^2 = (3/2)^2$$

$$(x - 3/2)^2 + y^2 = (3/2)^2$$

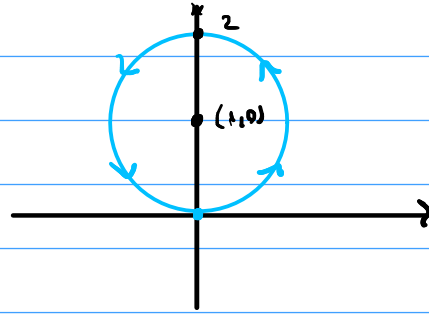
ex 6: $r = 2\sin\theta \Rightarrow$

$$r^2 = 2r\sin\theta$$

$$x^2 + y^2 = 2y$$

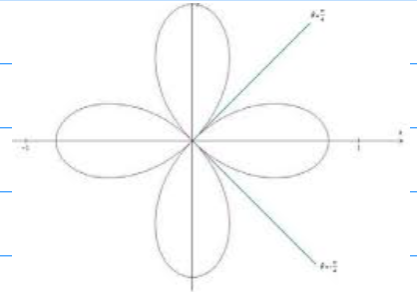
$$x^2 + y^2 - 2y + 1 = 1$$

$$x + (y-1)^2 = 1$$



ex 7: $r = 3\cos 2\theta$

Rosácea



ex 8: $r = 1 + \sin\theta$

Cardioid

