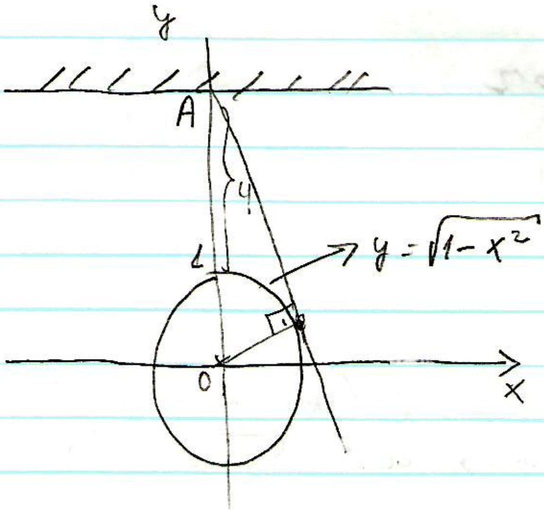
5.



O ponto do anel em que a formiga é capaz de ver o ponto A é o ponto onde a reta passando pelo ponto A tangencia o anel.

Daí,

$$y = mx + q$$

$$y = \sqrt{1-x^2}$$

$$y'(x) = \lim_{z \to x} \frac{\sqrt{1-z^2} - \sqrt{1-x^2}}{z-x}$$

$$= \lim_{z \to x} \frac{\left(\sqrt{1-z^2} - \sqrt{1-x^2}\right)}{(z-x)} \frac{\left(\sqrt{1-z^2} + \sqrt{1-x^2}\right)}{\left(\sqrt{1-z^2} + \sqrt{1-x^2}\right)}$$

$$= \lim_{z \to x} \frac{1-z^2 - (1-x^2)}{(z-x)\left(\sqrt{1-z^2} + \sqrt{1-x^2}\right)}$$

$$= \lim_{z \to x} \frac{-z^2 + x^2}{(z-x)\left(\sqrt{1-z^2} + \sqrt{1-x^2}\right)}$$

$$= \lim_{z \to x} \frac{-\cancel{(z-x)}(z+x)}{\cancel{(z-x)}\left(\sqrt{1-z^2} + \sqrt{1-x^2}\right)}$$

$$= \frac{-2x}{2\sqrt{1-x^2}}$$

$$// \; y'(x) = \frac{-x}{\sqrt{1-x^2}} \; //$$

Seja o ponto de tangência com coordenadas $(x_0, y_0 = \sqrt{1-x_0^2})$, temos:

$$y = \frac{-x_0}{\sqrt{1-x_0^2}}\, x + q$$

$$y_0 = \frac{-x_0}{\sqrt{1-x_0^2}}\, x_0 + q$$

$$\sqrt{1-x_0^2} = \frac{-x_0^2}{\sqrt{1-x_0^2}} + q$$

$$\frac{1-\cancel{x_0^2}+\cancel{x_0^2}}{\sqrt{1-x_0^2}} = q \Longrightarrow \left\| q = \frac{1}{\sqrt{1-x_0^2}} \right\| \quad (*)$$

O ponto $A = (0, 5)$ também pertence a reta, logo

$$y = \frac{-x_0}{\sqrt{1-x_0^2}}\, x + q$$

$$\| 5 = +q \| \quad (**)$$

De (*) e (**) segue-se que:

$$5 = \frac{1}{\sqrt{1-x_0^2}}$$

$$25 = \frac{1}{1-x_0^2}$$

$$25 - 25x_0^2 = 1$$

$$x_0 = \sqrt{\frac{24}{25}} = \frac{2}{5}\sqrt{6}$$

$$\left\| x_0 = \frac{2}{5}\sqrt{6} \right\| \Longrightarrow$$

$$y_0 = \sqrt{1 - x_0^2} = \sqrt{1 - \frac{4 \cdot 6}{25}}$$

$$= \frac{1}{5}$$

$\therefore$ $\boxed{\text{O ponto de tangência é } \left(\frac{2}{5}\sqrt{6}, \frac{1}{5}\right)}$