17. $y = \dfrac{x^2+3}{x^2+4}$ $\quad P \quad P' = 2x$; $\quad Q \quad Q' = 2x$

FIND POINT WHERE GRAPH HAS HORIZ. TANGENT LINE

(1) FIND DERIVATIVE

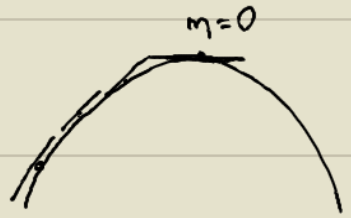
$$\frac{P'Q - PQ'}{Q^2}$$

$$y' = \frac{2x(x^2+4) - (x^2+3)2x}{(x^2+4)^2}$$

$$y' = \frac{2x[x^2+4-(x^2+3)]}{(x^2+4)^2}$$

$$= \frac{2x(x^2+4-x^2-3)}{(x^2+4)^2}$$

$$y' = \frac{2x}{(x^2+4)^2}$$



(2) SET DERIVATIVE EQUAL TO ZERO AND SOLVE

$$\frac{2x}{(x^2+4)^2} = 0$$

$$(x^2+4)^2 \left(\frac{2x}{(x^2+4)^2}\right) = 0(x^2+4)^2$$

$$2x = 0$$

$$\frac{2x}{2} = \frac{0}{2}$$

$$x = 0$$

(3) PLUG THE X-VALUE(S) INTO ORIG. FUNCTION AND FIND Y-VALUE(S)

$x = 0$

$$y = \frac{x^2+3}{x^2+4}$$

$$y = \frac{0^2+3}{0^2+4}$$

$$y = \frac{3}{4}$$

$$\left(0, \frac{3}{4}\right)$$