Find the equation of the tangent line at $x = \frac{\pi}{2}$ for $y = 4\cos\frac{1}{2}x$

Solution

$y = -\sqrt{2}x + \frac{\pi\sqrt{2}}{2} + 2\sqrt{2}$

$$f(x) = \sqrt{15x^2 + 1}$$

Find $f'(x)$

Solution

$$f'(x) = \frac{15x}{\sqrt{15x^2 + 1}}$$

$$h(x) = 4\sqrt{3x+1} + \frac{4}{x}$$

Find $f'(5)$

Solution

1.34

$$y = x^2 \tan\frac{1}{x}$$

Find y'

Solution

$$y' = -\sec^2\frac{1}{x} + 2x\tan\frac{1}{x}$$

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

Find $\frac{dy}{dx}$

Solution

$$y' = \frac{-2}{(1+x^2)(2y+1))}$$

Show that for $\sin(xy) + xy = 0 \longrightarrow \frac{dy}{dx} = -\frac{y}{x}$

Find $\frac{d^2y}{dx^2}$ for $x^2 + y^2 = 1$

Solution

$\frac{-1}{y^3}$

Find the x value(s) where there are horizontal tangents to the following curve.

$$x^2 - xy + y^2 = 9$$

Solution

$x = \pm\sqrt{3}$