

$$f(x) = \sin(x)$$

$$x_0 = \frac{\pi}{3}$$

$$f'(x) = (\sin(x))' = \cos(x)$$

$$f'\left(\frac{\pi}{3}\right) = \cos\left(\frac{\pi}{3}\right) = \frac{1}{2}$$

$$f\left(\frac{\pi}{3}\right) = \sin\left(\frac{\pi}{3}\right) = \frac{\sqrt{3}}{2}$$

$$y = \frac{\sqrt{3}}{2} + \frac{1}{2} \left(x - \frac{\pi}{3}\right) = \frac{\sqrt{3}}{2} + \frac{1}{2}x - \frac{\pi}{6}$$