

$$(8) f(x) = \sec^5 6x \quad f'(x) = ?$$

$$f(x) = (\sec 6x)^5$$

$$f'(x) = 5(\sec 6x)^4 (\sec 6x \tan 6x)(6)$$

$$f'(x) = 30 \sec^5 6x \tan 6x$$

$$(9) y = \cos^2 x - \sin^2 x \quad y' = ?$$

$$\sin^2 x = 1 - \cos^2 x$$

$$y = \cos^2 x - (1 - \cos^2 x)$$

$$y = 2\cos^2 x - 1$$

$$y' = 4(\cos x)(-\sin x)$$

$$y' = -4 \cos x \sin x$$

$$2 \cos x \sin x = \sin 2x \quad y' = -2 \sin 2x$$

$$(10) x = \cot(xy) \quad \frac{dy}{dx} = ?$$

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

$$-\sin^2(xy) = y + xy'$$

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

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

$$(11) y = 5x^3 - 2x$$

y is decreasing at 5 units per second
When $x = 2$ what is the rate of x ?

$$\frac{dy}{dt} = (15x^2 - 2) \frac{dx}{dt}$$

$$\frac{dy}{dt} = -5$$

$$x = 2$$

$$-5 = (15(2)^2 - 2) \frac{dx}{dt}$$

$$\frac{-5}{58} = \frac{58 \frac{dx}{dt}}{58}$$

$$\frac{dx}{dt} = -\frac{5}{58} \text{ units/sec}$$

(12)



$$\frac{dA}{dt} = 5 \frac{\text{in}^2}{\text{sec}} \quad r = 8 \quad \frac{dr}{dt} = ?$$

$$A = \pi r^2$$

$$\frac{dA}{dt} = 2\pi r \cdot \frac{dr}{dt} \quad 5 = 2\pi(8) \frac{dr}{dt}$$

$$\frac{5}{16\pi} = \frac{16\pi \frac{dr}{dt}}{16\pi}$$

$$\frac{dr}{dt} = \frac{5}{16\pi} \frac{\text{in}}{\text{sec}}$$