

3.5 Derivatives of Trigonometric Functions**MEMORIZE**

$$y = \sin x$$

$$y' = \cos x$$

$$y = \cos x$$

$$y' = -\sin x$$

$$y = \tan x$$

$$y' = \sec^2 x$$

$$y = \sec x$$

$$y' = \sec x \tan x$$

$$y = \csc x$$

$$y' = -\csc x \cot x$$

$$y = \cot x$$

$$y' = -\csc^2 x$$

Find y'

Ex 1) $y = \sin x - \tan x + 5x$

Ex 2) $y = x \csc x$

Find y'

$$\text{Ex 3) } y = \frac{\sin x + \cos x}{\cos x}$$

Find y'

$$\text{Ex 4) } y = \frac{\cos x}{1 + \sin x}$$

Ex 5) Write an equation for the tangent line
and normal line to graph
 $y = x + \cos x$ at $(0, 1)$

23 $S = t^3 - 6t^2 + 9t$

$a(t) = ?$ $v(t) = 0$

$v = 3t^2 - 12t + 9$

$a = 6t - 12 \rightarrow a(1) = 6 \cdot 1 - 12 = -6$

$a(3) = 6 \cdot 3 - 12 = 6$

$3t^2 - 12t + 9 = 0$

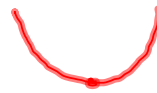
$3(t^2 - 4t + 3) = 0$

$3(t-1)(t-3) = 0$

$t = 1 \quad t = 3$

①

$$s = t^2 - 3t + 2 \rightarrow$$



Change direction when $s' = 0$

$$s' = v = 2t - 3$$

$$v = 2t - 3$$

$$0 = 2t - 3$$

$$\frac{3}{2} = \frac{2t}{2}$$

$$t = 1.5$$

