

## 2.4 Practice (Trigonometric Derivatives)

Ex) (a) Find  $D_x(\sin x)$  using definition of derivative.

(b) Use quotient rule to find derivative of  $f(x) = \csc x$ .

Ex 2 Find derivatives

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

(b)  $y = \frac{\sin x + \cos x}{\tan x}$

(c)  $y = 4x^5 \csc x$

## Midterm 1 Review

EX1 Find the limits.

$$(a) \lim_{x \rightarrow \infty} \frac{x^3 - 2x^2 + \sqrt[5]{4x^{19}} - 1}{2x^2 - 4x^4}$$

$$(b) \lim_{x \rightarrow -\infty} \frac{3x^3 - 4x^2 + 5x}{1 - 7x^3}$$

$$(c) \lim_{x \rightarrow \infty} \frac{-5x^9 - 8x^7 + 3}{x^2 + x + 1}$$

Ex 2 Find the limits

$$(a) \lim_{x \rightarrow 0} \left( \frac{\sin(3x) \tan(5x) + 2x}{x \cos x} \right)$$

$$(b) \lim_{x \rightarrow 4} \frac{3x^2 - 5x - 28}{x^2 - 16}$$

Ex 3 Find the limits.

$$(a) \lim_{x \rightarrow 1} \frac{(x+2)(x-5)}{(x-1)x^2(x+3)}$$

$$(b) \lim_{x \rightarrow 3^+} \frac{x+2}{\sqrt{x-3}}$$

Ex 4 Describe discontinuities for  
 $f(x) = \frac{x^3(4x-1)(x+2)}{(x+2)(x-5)(x^2)}$

Ex 5 Use defn of derivative to find  $f'(x)$ .

(a)  $f(x) = \frac{1}{\sqrt{2x-1}}$

(b)  $f(x) = x^3 + 5$

Ex 6 Find the derivatives. (Don't bother to simplify.)

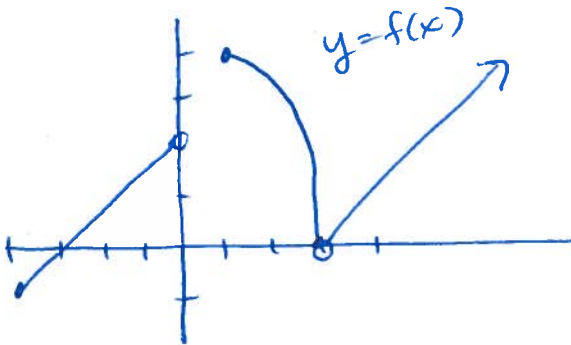
$$(a) y = \sin x \sec x + \cos x$$

$$(b) y = (3x^5 + \pi x^2 - 7)(x^{-6} + 9)$$

$$(c) y = \frac{4x^2 + 3x - 8}{(x+1)(x^2+1)}$$

Ex 7 Find the eqn of the tangent line  
to  $y = \frac{1+x}{x^2-3}$  at  $x=1$ .

Ex 8



Discuss continuity  
+ limits.

$$\lim_{x \rightarrow 1^+} f(x) =$$

$$\lim_{x \rightarrow 1^-} f(x) =$$

$$\lim_{x \rightarrow 3} f(x) =$$

$$f(3) =$$

$$f(0) =$$