

SOLUTIONS CALC I MTWT
SPRING 2019 QUIZ #1ne

Pg 1ne

① The final exam is 8:00-9:50 MONDAY, MAY 6

① $f(x) = \tan(x) - \sec(x)$

$\Rightarrow f'(x) = \boxed{\sec^2(x) - \sec(x)\tan(x)}$

NOTE: OTHER
SOLUTIONS
ARE
POSSIBLE

② $f(x) = \sqrt{x} + \frac{1}{\sqrt[3]{x}} \Rightarrow f'(x) = \boxed{\frac{1}{2}x^{-1/2} - \frac{1}{3}x^{-4/3}}$
 $= x^{1/2} + x^{-1/3}$

③ $f(x) = \sqrt[3]{x^2+4x} = (x^2+4x)^{1/3} \Rightarrow f'(x) = \boxed{\frac{1}{3}(x^2+4x)^{-2/3}(2x+4)}$

④ $f(x) = \frac{x^{-3}-x}{\sin(x)} \Rightarrow f'(x) = \boxed{\frac{(\sin(x))(-3x^{-4}-1) - (x^{-3}-x)(\cos(x))}{(\sin(x))^2}}$

⑤ $f(x) = \cot(x^4) \Rightarrow f'(x) = \boxed{-\csc^2(x^4)(4x^3)}$

⑥ $f(x) = \frac{1}{x^3} - \frac{1}{x^2} = x^{-3} - x^{-2} \Rightarrow f'(x) = \boxed{-3x^{-4} + 2x^{-3}}$

$$(7) f(x) = \frac{\cos(x)}{x^2} \Rightarrow f'(x) = \frac{(x^2)(-\sin(x)) - (\cos(x))(2x)}{(x^2)^2} \quad \text{pg 240}$$

or

$$f(x) = \cos(x)(x^{-2}) \Rightarrow f'(x) = [\cos(x)(-2x^{-3}) + (x^{-2})(-\sin(x))]$$

$$(8) f(x) = -x \csc(x) - \cos(5x)$$

$$\Rightarrow f'(x) = [(-x)(-\csc(x)\cot(x)) + (\csc(x)(-1)) - (-\sin(5x))(5)]$$

or simplified

$$= [x \csc(x)\cot(x) - \csc(x) + 5 \sin(5x)]$$

$$(9) f(x) = (3x^2 + 1) \sin(x) \tan(x)$$

$$f'(x) = [(6x) \sin(x) \tan(x) + (3x^2 + 1)(\cos(x)) \tan(x)] + (3x^2 + 1)(\sin(x))(\sec^2(x))$$

$$(10) f(x) = (x^3 - 3x) \left(\frac{\cos(x)}{3x + 2} \right)$$

$$f'(x) = (x^3 - 3x) \left(\frac{(3x + 2)(-\sin(x)) - (\cos(x))(3)}{(3x + 2)^2} \right) + \left(\frac{\cos(x)}{3x + 2} \right) (3x^2 - 3)$$