

## Math 201 Quiz 7B

October 7, 2019

Name: \_\_\_\_\_

Instructions: No calculators. Use your own scrap. Write your fully simplified answers in the space provided.

1. Complete the following rules/computations:

(a)  $\frac{d}{dx}(f(x) - g(x)) =$  \_\_\_\_\_ (b)  $\frac{d}{dx} \sin x =$  \_\_\_\_\_

(c)  $\frac{d}{dx} f(g(x)) =$  \_\_\_\_\_ (d)  $\frac{d}{dx} x^2 =$  \_\_\_\_\_

(e)  $\frac{d}{dx} \sqrt{x} =$  \_\_\_\_\_ (f)  $\frac{d}{dx} \frac{1}{x} =$  \_\_\_\_\_

2. Use the limit definition of the derivative to find  $f'(x)$  if  $f(x) = \cos x$ . Show your work below.

3. Hence, by the above, find the equation of the tangent line to  $f(x)$  at the point where  $x = \frac{3\pi}{4}$ .

$y =$  \_\_\_\_\_

4. Differentiate:

(a)  $\frac{d}{dx} \frac{3x + \frac{1}{x} + 4}{5} =$  \_\_\_\_\_ (b)  $\frac{d}{dx} \cos(\sqrt{x} - x^2 + 1) =$  \_\_\_\_\_

**Bonus (can only be completed if all above are attempted):**

1. Compute:  $\frac{d}{dx} \frac{1-x^2}{\sin(x^3)} =$  \_\_\_\_\_

2. State the power rule: \_\_\_\_\_

3. State the product rule: \_\_\_\_\_

4. State the quotient rule: \_\_\_\_\_