MATH 125 Fall 2019
Test 2 Practice Problems
(This is NOT a comprehensive review!!!)

1. Find an equation of the tangent line to the curve at the given point.

$$y = 4x^3 - \sqrt{x} + 5, \quad (1, 8)$$

2. Differentiate the function.
   a. $f(x) = x^{1/5} \tan x$

b. $g(x) = \dfrac{x^2 + 4x - 1}{x^2 + 9}$

c. $h(x) = \sqrt[3]{5x + 6 + \dfrac{1}{x}}$

d. $f(x) = \cos^2(x \sin x)$

3. For what values of a and b is the line $2x + y = b$ tangent to the parabola $y = ax^2$ when $x = -1$?

4. Find dy/dx by implicit differentiation.
$$y \sin x = y^{2/3} - 3x^2$$

5. The top of a ladder slides down a vertical wall at a rate of 0.2 m/s. At the moment when the top of the ladder is 10 m from the floor, the bottom slides away from the wall at a rate of 0.4 m/s. How long is the ladder?

6. Use a linear approximation (or differentials) to **estimate** the given number.

$$(8.042)^{1/3}$$