

MATH 133 – Calculus with Fundamentals 1
Quiz 7 – November 19, 2015

Your Name: _____

Directions

Do all work in the space provided below or on the back of the second sheet. There are 30 total points possible. You may use a calculator but not any graphing features.

Questions

1) (a) (7) Find $\frac{dy}{dx}$ by implicit differentiation given that $x^2y^3 - 5xy + x = 1$.

(b) (3) Find the equation of the tangent line to the curve with the equation $x^2y^3 - 5xy + x = 1$ at $(x, y) = (0, 1)$ using your answer from (a).

2) Differentiate the following, but don't simplify:

(a) (5) $f(x) = \ln(\cos(x) + \sin(3x))$

(b) (5) $g(x) = \tan^{-1}(e^{5x}) + \sin^{-1}(x^2)$

- 3) (10) Water is being poured into a circular cylinder tank with constant radius $r = 5$ meters. If the height of the water in the tank is increasing at a rate of 1 meter per minute, what is the rate of change of the volume of the water in the tank? (The volume of a circular cylinder of radius r and height h is $V = \pi r^2 h$.)