

Circle your Instructor:
Faudree, Williams, Zirbes

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Math 251 Fall 2017

Quiz #6, October 18th

Name: _____

There are 25 points possible on this quiz. This is a closed book quiz. Calculators and notes are not allowed. **Please show all of your work!** If you have any questions, please raise your hand.

Exercise 1. (4 pts.) Find $\frac{dy}{dx}$ by implicit differentiation for $\cos y = x^2 - y$.

Exercise 2. (6 pts.) Find the derivatives of the following functions.

(a) $f(x) = x \arccos(2x)$

(b) $g(x) = \arctan(\sqrt{x})$

Exercise 3. (3 pts.) Find the derivative of the function $g(x) = \sqrt{\ln x}$.

Exercise 4. (4 pts.) Use logarithmic differentiation to find the derivative of the function

$$y = (\sin x)^{2x}.$$

Exercise 5. (8 pts.) The position function of a particle is given by $s = \frac{1}{3}t^3 - 3t^2 + 5t$ where t is measured in seconds and s in meters. Further, assume the first and second derivatives are $s'(t) = t^2 - 6t + 5$ and $s''(t) = 2t - 6$.

- a.) What is the velocity function of the particle?

- b.) What is the acceleration function of the particle?

- c.) When is the particle at rest?

- d.) When is the particle moving to the right?

- e.) At time $t = 2$, is the particle speeding up or slowing down? Explain your answer.