

Math 124 Section G Online, Fall 2019 Midterm 2

November 19, 2019

Name _____

Student Number _____

Seat Number _____

Instructions.

- These exams will be scanned. **Please write your name clearly for easy recognition.**
- There are 4 questions. The exam is out of 40 points.
- You are allowed to use one page of notes written only on one side of the sheet in your own handwriting.
- You can only use a Ti-30x IIS calculator. Unless otherwise stated, you have to give exact answers to questions. ($\frac{2\ln 3}{\pi}$ and $1/3$ are exact, 0.699 and 0.333 are approximations for the those numbers.)
- **Show your work.** If I cannot read or follow your work, I cannot grade it. **You may not get full credit for a right answer if your answer is not justified by your work.** If you continue a question on the last page, make a note for me.

Question	points
1	
2	
3	
4	
Total	

1. Find $\frac{dy}{dx} = y'$ for the following functions.

(a) $y = \frac{1}{x^2 + \sqrt{\tan x + 4^x}}$

(b) $xe^y - 5xy + xy^2 = \cos y$

(c) $y = (x^2 + 1)^{5x}$

2. Use linear approximation to estimate the value of $\sqrt[5]{33}$. Is your approximation more or less than the actual value. Explain. (This question must be done without the use of a calculator.)

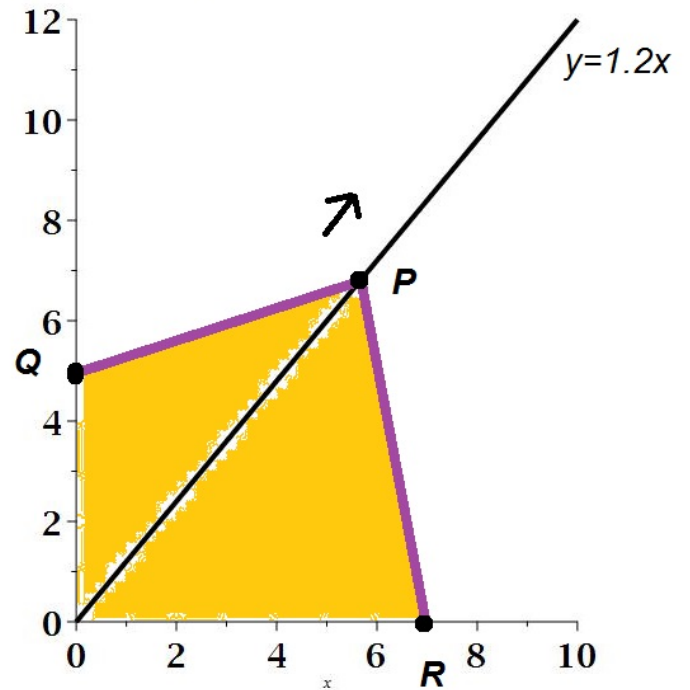
3. Compute the values of $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at the point where $t = 2$ for the parametric equations

$$x = 5e^{t-2} + 5t^3$$

$$y = \ln(t - 1) + t.$$

4. An elastic band is attached to the points $Q(0,5)$, $R(7,0)$, and P . The point P moves on the line $y = 1.2x$ getting away from the origin at a speed of 1.7 units per second.

- (a) How fast is the x -coordinate of the point P changing?



- (b) How fast is the shaded area increasing when the point P is 15 centimeters from the origin?