Math 34A Winter 2020
Old Midterm 3 #1

No calculators

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Excellence Bonus ____ / 1

Score ____ / 34

Put answers in the boxes provided. **Show high quality work** for **all answers**. Points may be awarded for this.

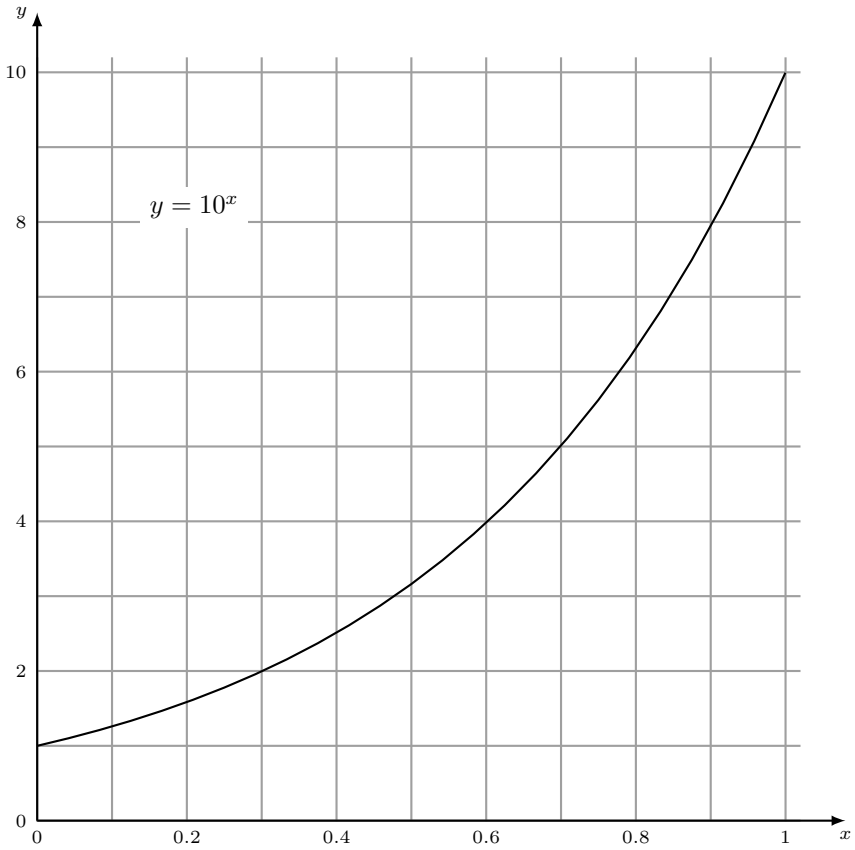
TA: ☐ Garo ☐ Sam ☐ Trevor **Section Time:** ☐ 8am ☐ 6pm ☐ 5pm ☐ 7pm

1. [/6] Use the graph given to find

(a) $\log(1000) + \log(0.34) =$

(b) Solve $\log(y) = 1.87$. Then $y =$

(c) The average rate of change of 10^x between $x = 0.2$ and $x = 0.7$ is



2. [/6] Find the following derivatives. Simplify your answers.

(a) $\frac{d}{dx}\left(2e^{7x}+5x^3-7\right) =$ $\boxed{}$

(b) $\frac{d^2}{dx^2}\left(3x^4+12\sqrt{x}\right) =$ $\boxed{}$

(c) If $f(x) = cx^2 + 16/x$, then $f'(2) =$ $\boxed{}$

3. [/4] The height of a tree is increasing at a constant rate. t years after 1950 the height is $h(t)$ feet, where $h(5) = 40$ and $h'(5) = 2$.

(a) How tall was the tree in 1975?

The tree was $\boxed{}$ feet tall

(b) What year (ex: 1982) did the tree reach a height of 200 feet?

The tree was 200 feet tall in $\boxed{}$.

4. [/8] This question is about the function

$$f(x) = 2x^3 - 3x^2 - 12x + 5$$

(a) What is the slope of the graph $y = f(x)$ at $x = 1$?

slope = $\boxed{}$

(b) What is the equation of the tangent line to the graph at $x = 0$? (Please give answer in the form $y = mx + b$.)

$y =$ $\boxed{}$

(c) For which x value(s) is the graph $y = f(x)$ concave up?

$x =$ $\boxed{}$

(d) For what value(s) of x does the graph have slope 0?

$x =$ $\boxed{}$

5. [/10] The height of a rocket above the ground after t seconds is $-3t^2 + 30t$ meters.

(a) What was the velocity of the rocket after t seconds?

velocity = ☐ m/s

(b) What was the initial speed of the rocket?

initial speed = ☐ m/s

(c) What was the acceleration of the rocket after 2 seconds?

acceleration = ☐ m/s^2

(d) When was the velocity zero?

At t = ☐ seconds

(e) How high above the ground was the rocket when the velocity was zero?

height = ☐ meters