Math 34A Winter 2020
Old Midterm 3 #2

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.

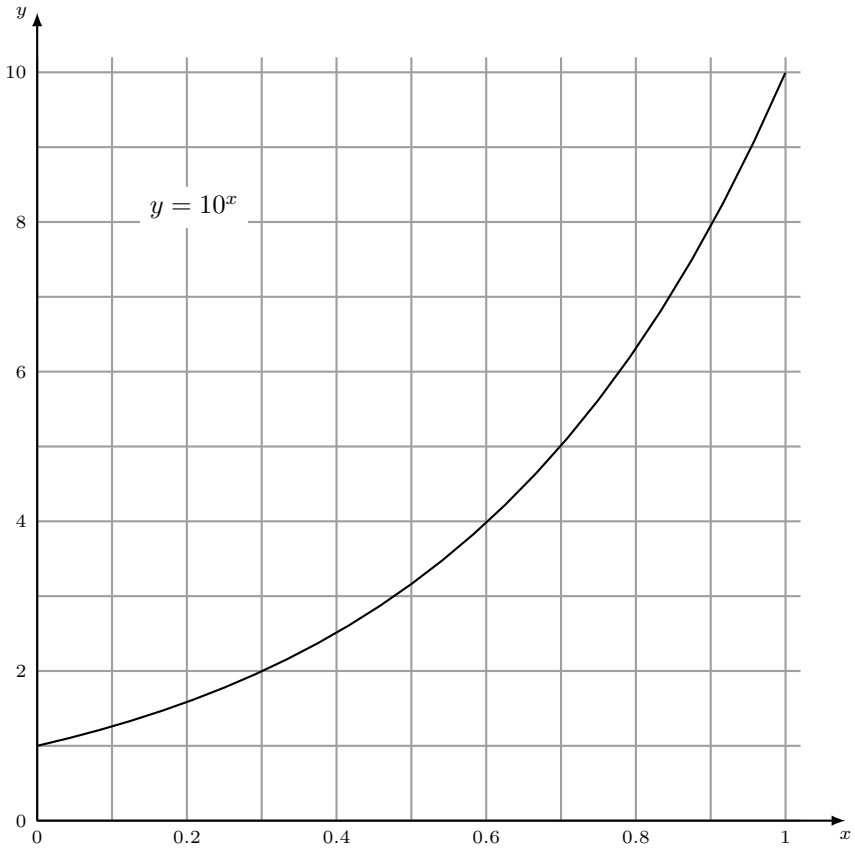
TA: ☐ Garo ☐ Sam ☐ Trevor **Section Time:** ☐ 8am ☐ 6pm ☐ 5pm ☐ 7pm

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

(a) $\log(\sqrt{480}) =$

(b) Solve $10^x = 1/59$ Then $x =$

(c) The slope the graph at $x = 0.55$ is



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

(a) $\frac{d}{dx}\left(7x^3+3x-4\right) =$ [ ]

(b) $\frac{d^2}{dx^2}\left(9x^2+5e^{3x}\right) =$ [ ]

(c) If k is a constant, then $\frac{d}{dx}\left(x^{k-1}+k^2\right) =$ [ ]

3. [/4] The temperature in $^\circ$ C of my cup of coffee t minutes after I made it is $f(t)$. Suppose $f(5) = 88$ and $f'(5) = -2$. Use the tangent line approximation to estimate...

(a) The temperature of my coffee 7 minutes after I made it

The temperature was [ ] $^\circ$ C

(b) When was the temperature 70° C? Write the number of minutes after I made it.

At [ ] minutes.

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

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

(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 $x = 1$? (Please give answer in the form $y = mx + b$.)

$y =$ $\boxed{}$

(c) What is the y-coordinate of the point on the graph where the slope is zero?

$y =$ $\boxed{}$

(d) For what value of x does the graph have slope 11?

$x =$ $\boxed{}$

5. [/10] The height of a rocket above the ground in meters after t seconds is $h(t) = 500 - 3t^2 + 60t$.

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

velocity = ☐ m/s

(b) What was the acceleration of the rocket after t seconds?

acceleration = ☐ m/s^2

(c) After how many seconds was the velocity 18 m/s?

After ☐ seconds

(d) What was the maximum height of the rocket above the ground?

height = ☐ meters

(e) How many meters did the rocket travel between $t = 0$ and $t = 2$ seconds?

☐ meters