

## Quiz, Fall Week 9

Name: \_\_\_\_\_

Points possible: 100

Math 1050-90, Fall 2021, Due 11/2 at 11:59 p.m.

**Rules/Suggestions:** Write with a dark pencil, so that your work is visible. **You are graded on your work, not just answers. Even if you do calculations in your head or on scratch, show work if space is provided.** Write the final answer in the box.

Notes: You are on your honor for this to be your own work. (You can ask for help on quiz material, but you should not ask for help on specific problems.)

1. (12 points) Find the domain of  $g(x) = \frac{1}{\log(x)}$

Answer:

2. Solve the equations. Check answers to see if they are false solutions. If any is, note this.

(2.1) (12 points)  $\log_3(20 - x) - \log_3(x) = \log_3(x)$

Answer:

(2.2) (12 points)  $3 \ln(x - 4) - 1 = 5$

Answer:

3. Find the requested information for the function, writing “none” if appropriate. Write asymptotes as equations and intercepts as ordered pairs.

$$f(x) = -\log_2(x + 3)$$

(3.1) (6 points)

Domain:

Range:

(3.2) (4 points)

$x$ -intercept:

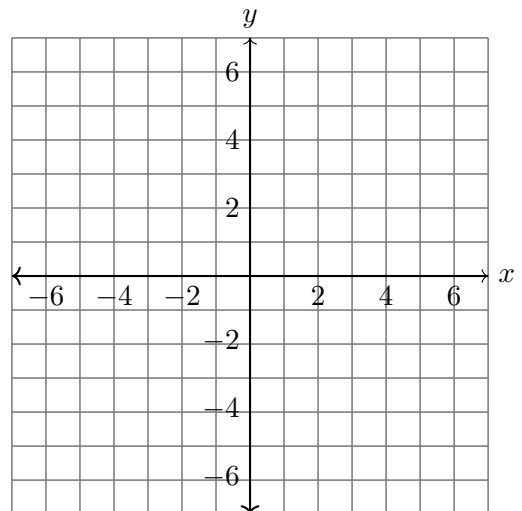
- (3.3) (4 points) (Note, give the EXACT  $y$ -intercept. It will contain a log expression.)

$y$ -intercept:

(3.4) (5 points)

Asymptote:

- (3.5) (15 points) Sketch the graph, carefully marking intercept(s), the asymptote, and two points with INTEGER coordinates that the function goes through.



4. A bacteria culture starts at 2.0 billion bacteria and grows at a fixed rate. After 8 hours there are 7.0 billion bacteria. Answer the questions below. Notice you are asked for the exact and approximate forms of each answer. The exact form can be found without a calculator. This is what you will write on the exam. If you enter your exact answer into a calculator, you get the approximate answer. Use the exact answer from part (3.1) to do parts (3.2) and (3.3).

(4.1) (10 points) Find the growth rate per hour. (Hint: this situation can be modeled by  $A(t) = A_0 e^{kt}$  ...you are being asked to find  $k$  and convert it to a percentage.)

Exact Answer:	Approx. Answer (Round to 2 decimal places.):
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(4.2) (10 points) How many billion bacteria will there be 10 hours after the start?

Exact Answer:	Approx. Answer (Round to 1 decimal place)
billion bacteria	

(4.3) (10 points) How long will it take for the population to reach 20 billion?

Exact Answer:	Approx. Answer (Round to 1 decimal place and write as units)
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