

## Exam #3

October 30, 2017

Name \_\_\_\_\_

- You will be told when to begin the work and when to terminate work on the examination. You must stop when instructed. Points may be deducted in case of violations.
- Please show your work to support your answers that require calculations. Correct but unsupported answers may not be given full credit.
- The use of a cell phone or other electronic communication devices during the examination is not allowed. The exam will be canceled and a grade of “0” will be assigned to anyone who uses a cell phone during the examination or if one is found within hands reach.
- Calculators are not allowed on this exam.
- The exam consist of two parts. Part I contains five multiple choice questions worth 5 points each. Part II contains 5 open ended questions worth 17 points each if not stated otherwise.

## Part I

Choose your answer from five available choices. No partial credit will be given for wrong answers.

1. Which of the following is an exponential function

- (a)  $y = 5^{x+3}$
- (b)  $y = \frac{2x-1}{x^2+1}$
- (c)  $y = x^3$
- (d)  $y = 2x - 1$
- (e) None of the above

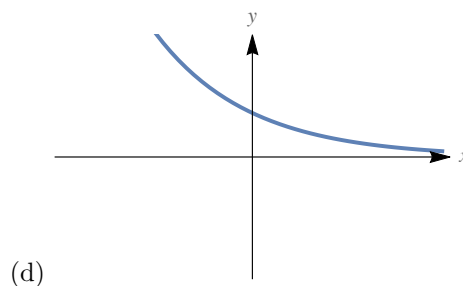
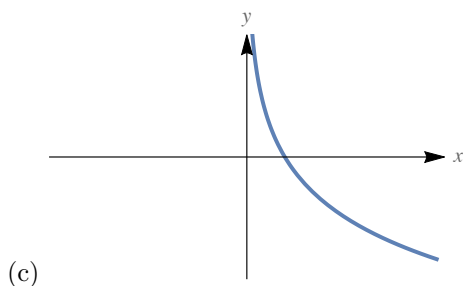
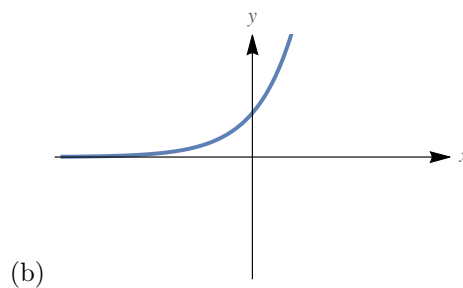
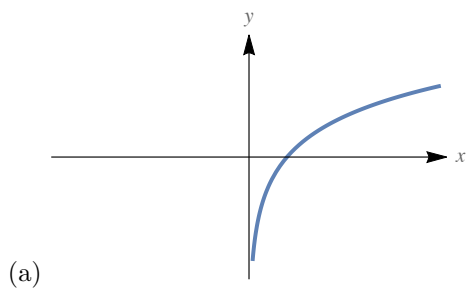
2. The value of  $\log_4(-2)$  is

- (a)  $-1$
- (b)  $1/2$
- (c)  $\sqrt{2}$
- (d)  $16$
- (e) None of the above

3. The equivalent exponential form of the equation  $\log_2(5) = a$  is

- (a)  $2^5 = a$
- (b)  $2^a = 5$
- (c)  $5^a = 2$
- (d)  $5^2 = a$
- (e) None of the above

4. The graphs of functions  $y = e^x$ ,  $y = (2/3)^x$ ,  $y = \ln(x)$ , and  $y = \log_{1/2}(x)$  are given below, not necessarily in that order. Match each graph with an appropriate equation.



5. The expression  $2 \log(x) - \log(y) - 3 \log(z)$  can be condensed to the following form.

(a)  $\log\left(\frac{x^2 z^3}{y}\right)$

(b)  $\log\left(\frac{2x}{yz^3}\right)$

(c)  $\log\left(\frac{x^2}{yz^3}\right)$

(d)  $\frac{\log x^2}{\log(yz^3)}$

(e) None of the above

## Part II

6. Solve the equation.

$$\log_2(x + 2) + \log_2(x + 5) = 2$$

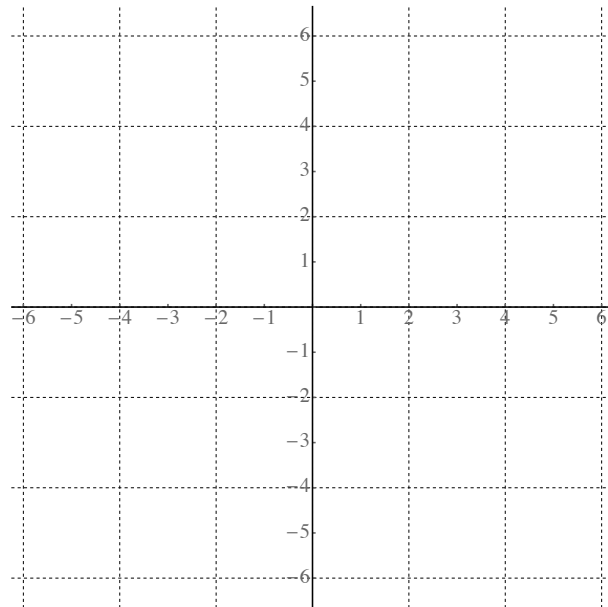
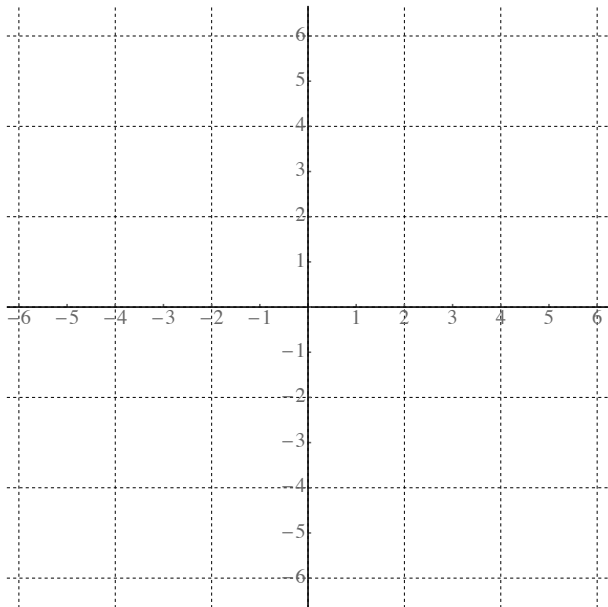
7. Graph  $y = 4 \cdot \log_3 x + 1 + 1$  using transformations. Start with the graph of a basic function – **plot accurately as least three points** and use them to perform transformations. Do one transformation at a time. Name the transformation and write the equation of the resulting function.

(i) Basic function:

(ii) transformation:

y=

y=

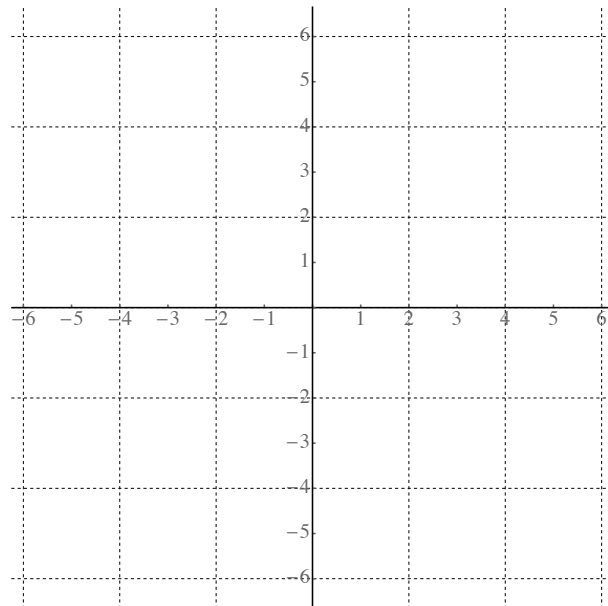
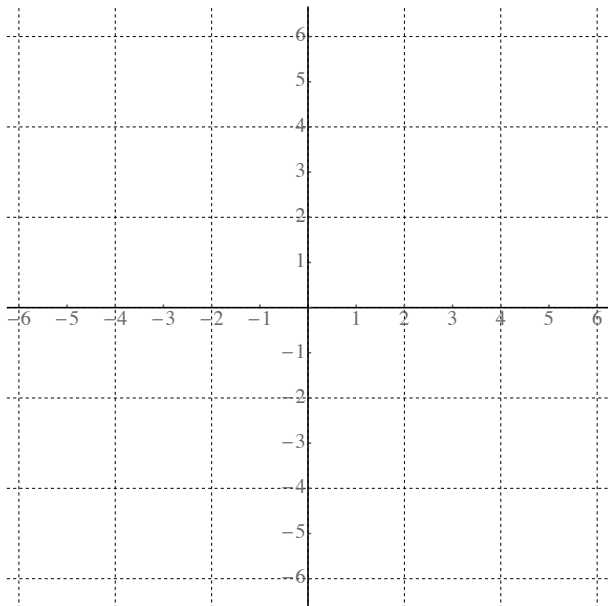


(iii) transformation:

(iv) transformation:

y=

y=



8. Solve the equation.

$$3 + e^{2x-1} = 5$$

9. Write as the sum and/or difference of logarithms. Express powers as factors.

$$\ln \left( \frac{(x-2)^3}{x^5(x+1)^3} \right)$$

10. Find the domain of the following function. Show your work.

$$f(x) = \log\left(\frac{1}{2} - 3x\right)$$

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