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) $y = x^3$

   (b) $y = 2x - 1$

   (c) $y = 5^{x+3}$
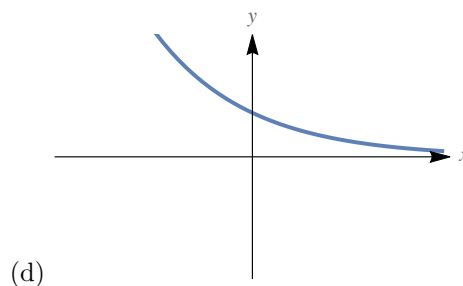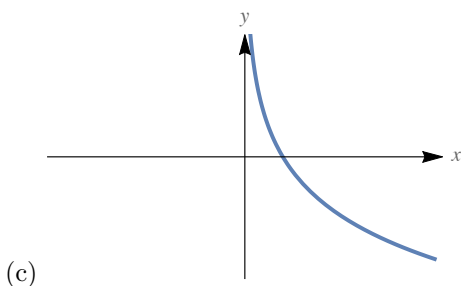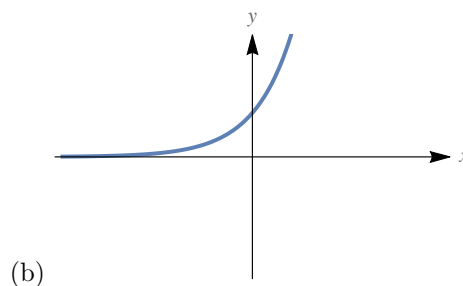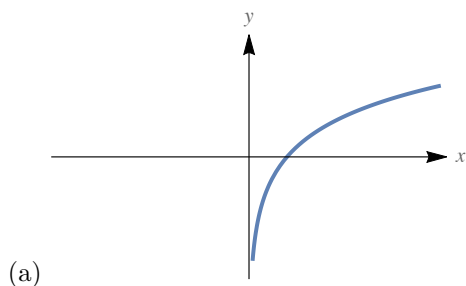
   (d) $y = \frac{2x-1}{x^2+1}$

   (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 $\log_2(a) = 5$ 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.

(a)

(b)

(c)

(d)

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

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

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

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

(d) $\log\left(\frac{x^2}{yz^3}\right)$
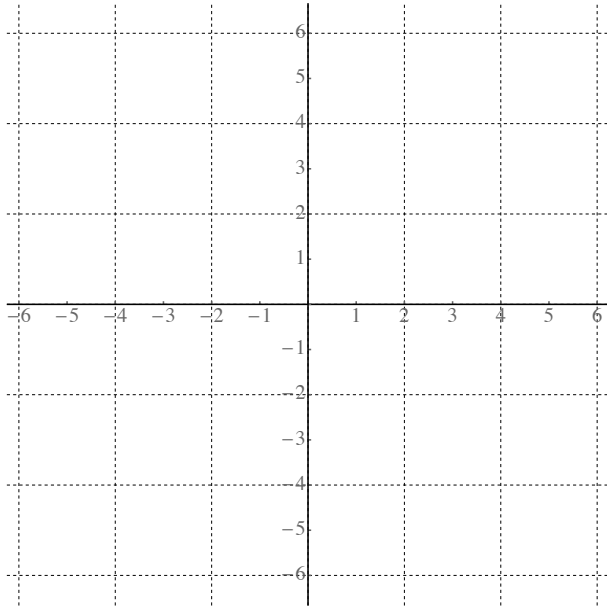
(e) None of the above

Part II

6. Solve the equation.

$$\log_2(x+3) + \log_2(x+4) = 1$$

7. Graph $y = 2 \cdot 3^{x+1} - 4$ 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.
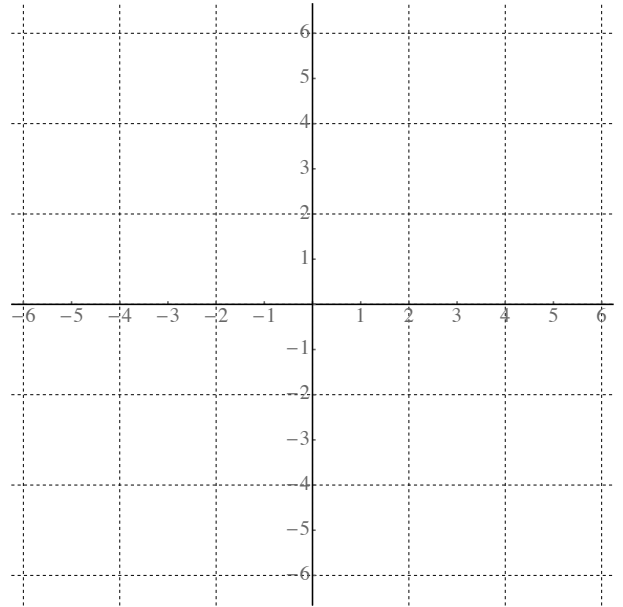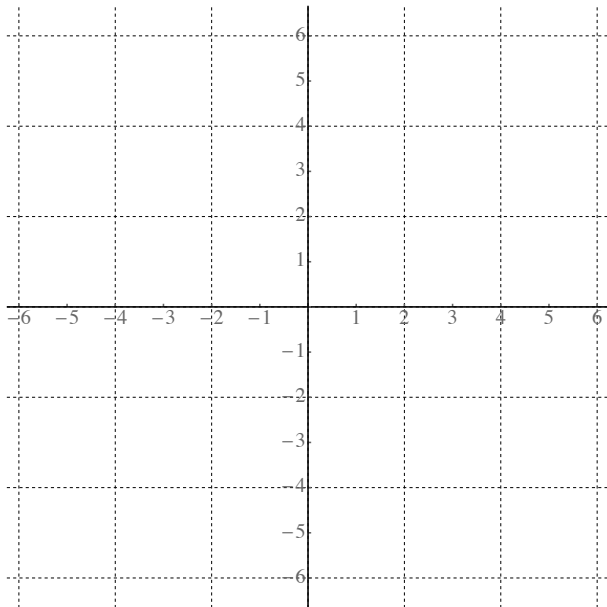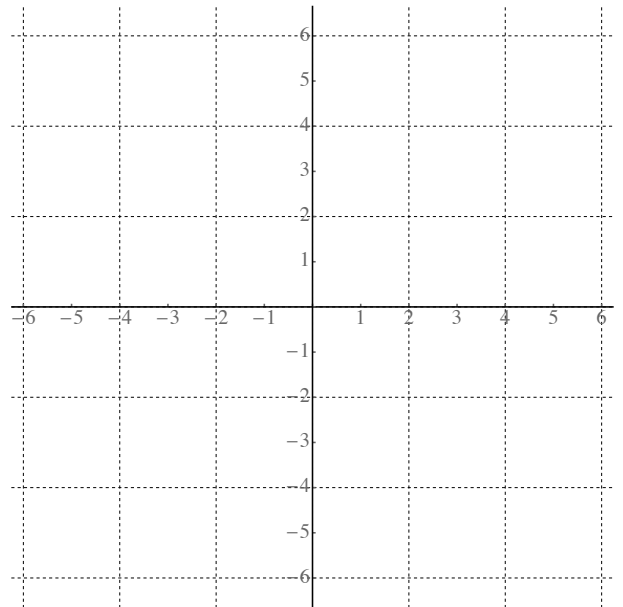
(i) Basic function:

y=

(ii) transformation:

y=

(iii) transformation:

y=

(iv) transformation:

y=

8. Solve the equation.
$$2 + e^{3x-1} = 4$$

9. Write as the sum and/or difference of logarithms. Express powers as factors.
$$\ln\left(\frac{x^3}{(x-2)^5(x+1)^3}\right)$$

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

$$f(x) = \log\left(\frac{1}{5} - 2x\right)$$

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