

Exam #1, ver B

January 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 7 open ended questions worth 12 points each if not stated otherwise.

Part I

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

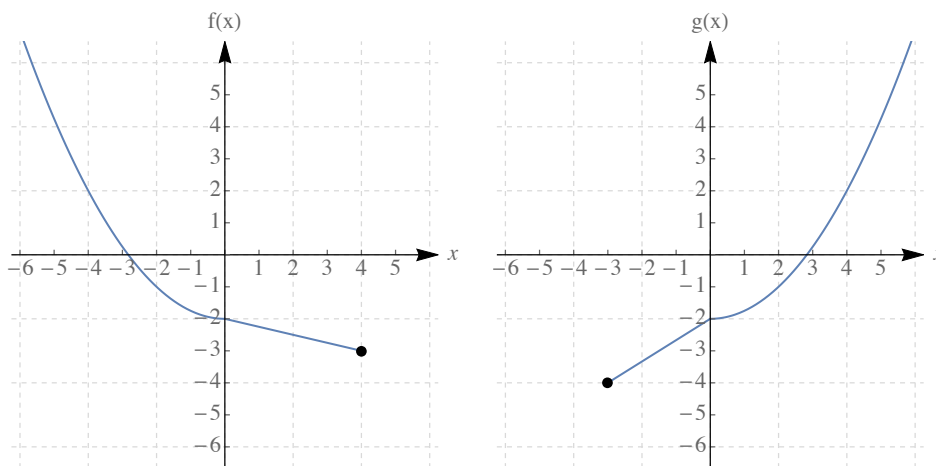
1. If $f(x) = \frac{4}{x}$ and $g(x) = \frac{2}{x+3}$, then $(f \circ g)(x)$ is

- (a) $2x + 6$
- (b) $\frac{2}{3x + 4}$
- (c) $\frac{2x}{3x + 4}$
- (d) $\frac{2x}{x + 3}$
- (e) None of the above

The domain of $f \circ g$ is

- (a) $(0, \infty)$
- (b) $(-\infty, \infty)$
- (c) $(-\infty, -3) \cup (-3, \infty)$
- (d) $(-\infty, -4/3) \cup (-4/3, 0) \cup (0, \infty)$
- (e) None of the above.

2. The graphs of $f(x)$ and $g(x)$ are given below. The value of $(f + g)(-3)$ is

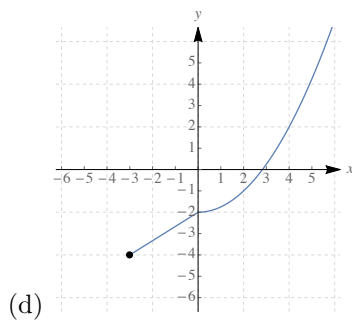
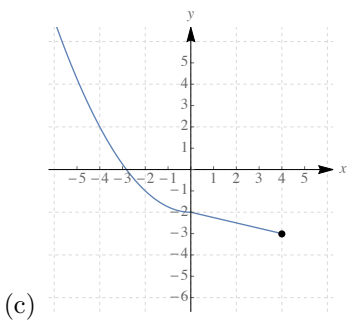
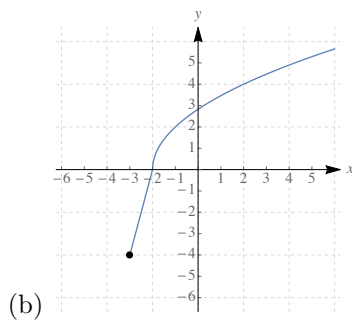
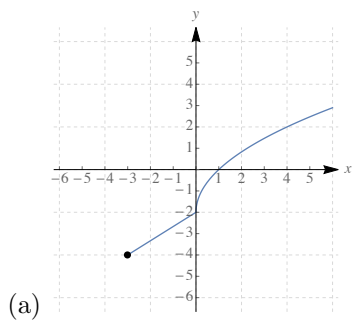
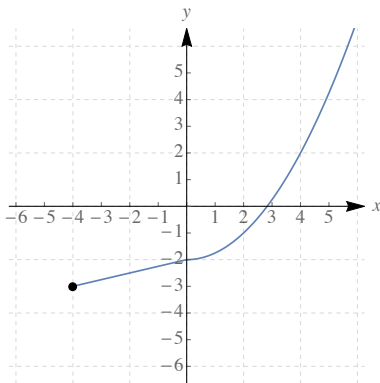


- (a) 0
- (b) -1
- (c) -3
- (d) -4
- (e) None of the above.

3. If f is one-to-one and $f(-2) = 7$, then which of the following statements are true? (Select all true statements.)

- (a) f is even
- (b) $f^{-1}(7) = 2$
- (c) $(1, 7)$ is on the graph of $y = f(-2x)$
- (d) $(-2, 7)$ is on the graph of the graph of f
- (e) None of the above.

4. The graph of a one-to-one function f is given below. Which of the following is the graph of its inverse?



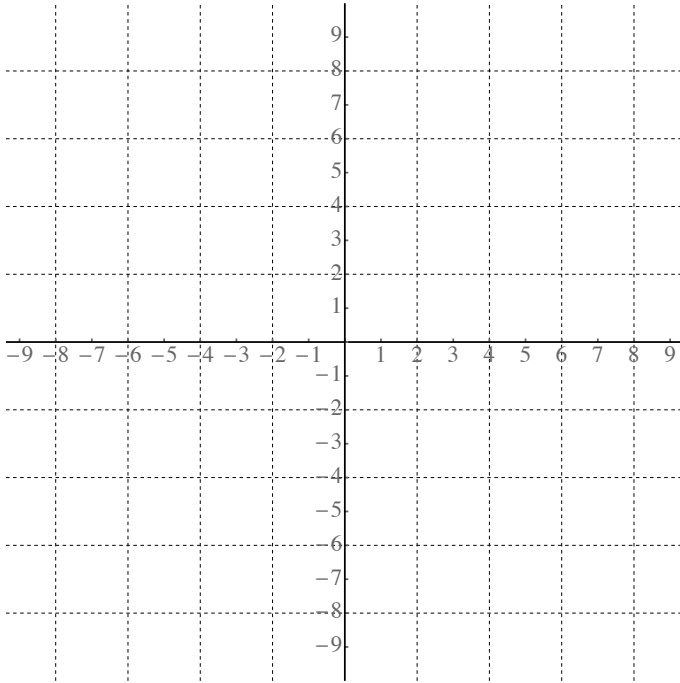
(e) None of the above.

5. If the graph of the function $y = x^2$ is vertically stretched by a factor of 2 and then shifted to the left by 5 then the resulting function has the equation

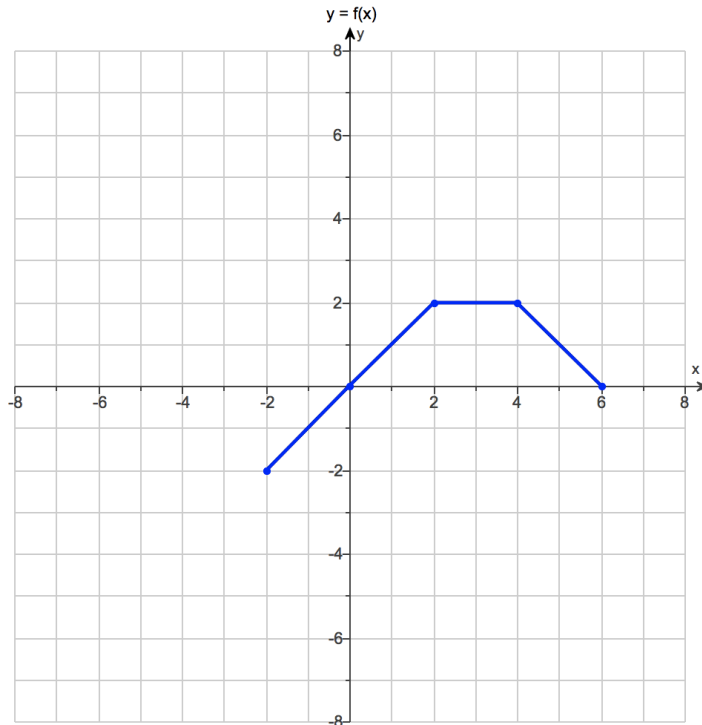
- (a) $y = 2x^2 + 5$
- (b) $y = 2x^2 - 5$
- (c) $y = 2(x - 5)^2$
- (d) $y = 2(x + 5)^2$
- (e) None of the above.

Part II

6. Graph the function $f(x) = \begin{cases} \sqrt{-x} & , x < -1 \\ x^2 & , -1 \leq x \leq 2 \\ x - 2 & , x > 2 \end{cases}$

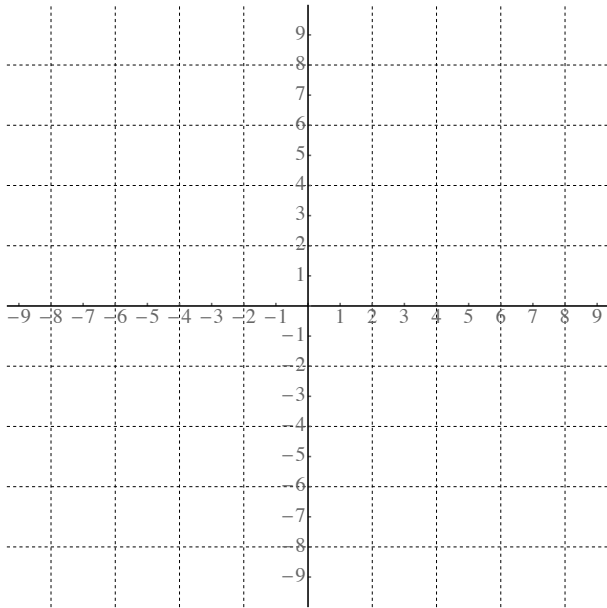


7. Given the graph of $f(x)$, use transformations to graph $y = -2f(-x + 3)$. Do one transformation at a time. Name the transformation and write the equation of the resulting function.



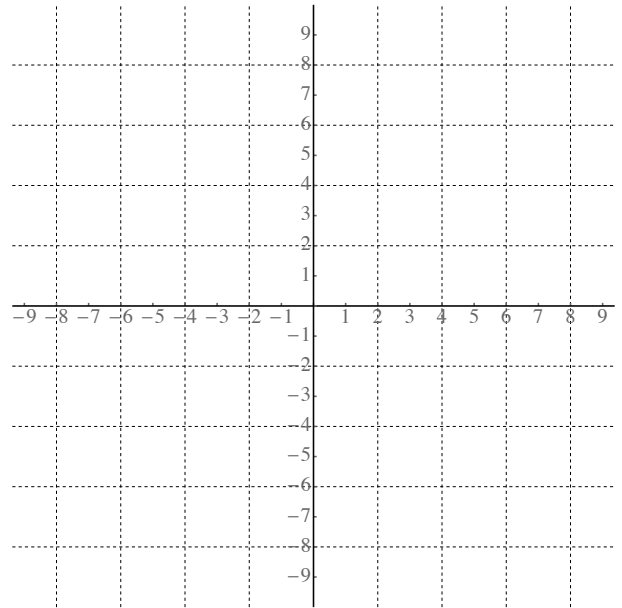
(i) transformation:

y=



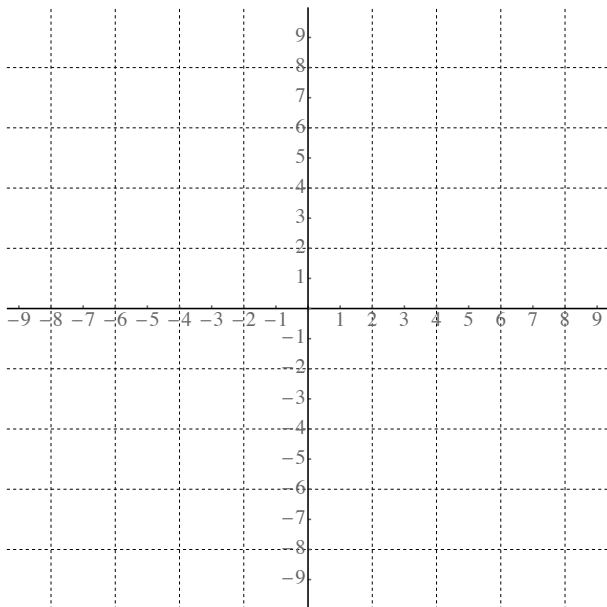
(ii) transformation:

y=



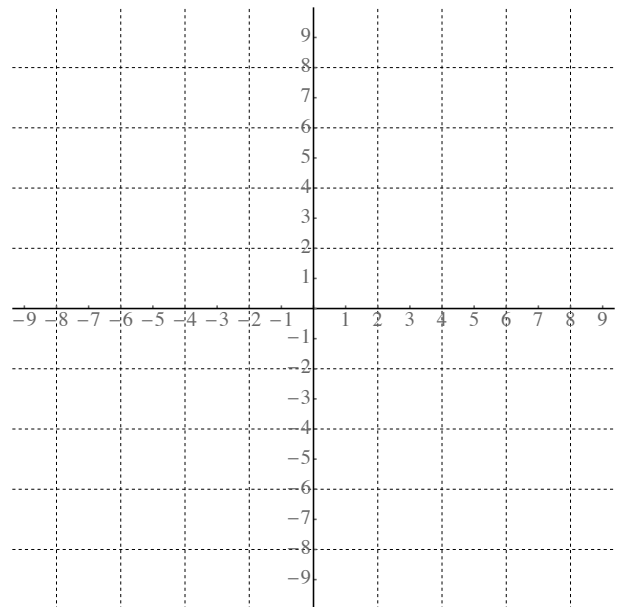
(iii) transformation:

y=



(iv) transformation:

y=

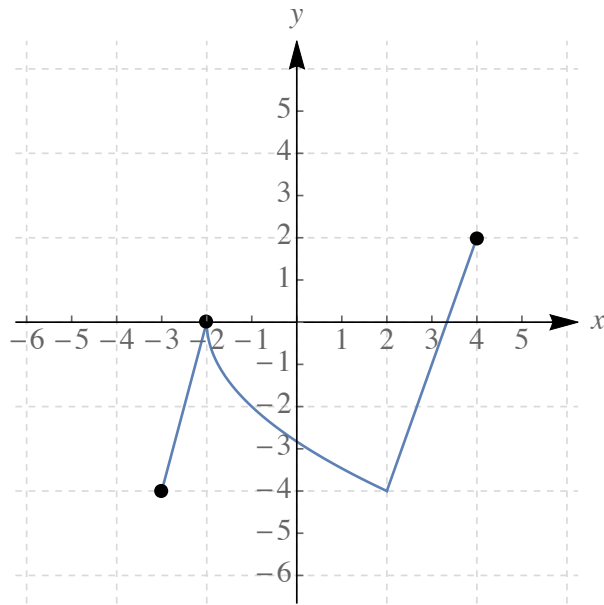


8. Find the difference quotient for $f(x) = \frac{2}{x-3}$.

9. Find the inverse of $f(x) = \frac{3}{x} + 2$

10. Find the domain of $f(x) = -3\sqrt{2x+5}$

11. Using the given graph of the function f , answer the parts (a)-(f) below.



(a) Find the domain of f . Express it in interval notation.

(b) Find the range of f . Express it in interval notation.

(c) Find the x -intercepts.

(d) Find the y -intercepts.

(e) Find the intervals on which f is increasing.

(f) Find the intervals on which f is decreasing.

12. (13 points) Find two functions $f(x)$ and $g(x)$ (neither of them identity) so that $h(x) = f(g(x))$, where

$$h(x) = \frac{7}{(3x-7)^3}$$