

MAC 1140, Spring 2018.

## Exam #1, ver. B

January 29, 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 three multiple choice questions worth 5 points each. Part II contains 5 open ended questions worth 19 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)  $(-\infty, -3) \cup (-3, \infty)$

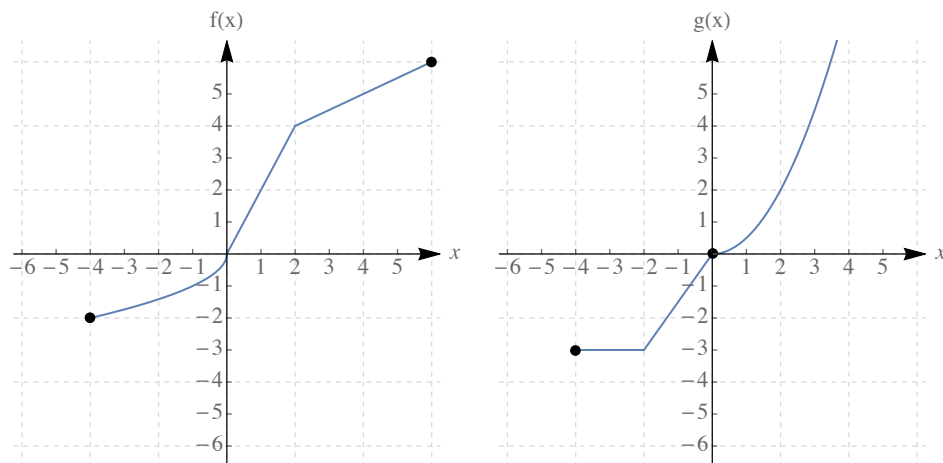
(b)  $(0, \infty)$

(c)  $(-\infty, -4/3) \cup (-4/3, \infty)$

(d)  $(-\infty, \infty)$

(e) None of the above.

2. The graphs of  $f(x)$  and  $g(x)$  are given below. The value of  $(f - g)(-4)$  is



(a) 1

(b) 2

(c) 3

(d) 4

(e) None of the above.

3. If  $f$  is one-to-one and  $f(12) = -3$ , then which of the following statements are true? (Select all true statements.)

(a)  $f^{-1}(-3) = 1/12$

(b)  $f$  is even

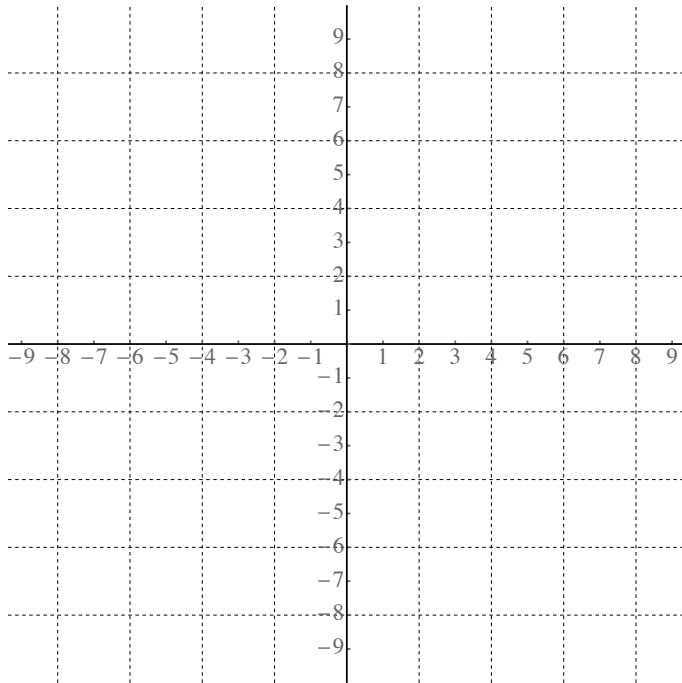
(c)  $(12, -3)$  is on the graph of the graph of  $f^{-1}$

(d)  $(1, -3)$  is on the graph of  $y = f(12x)$

(e) None of the above.

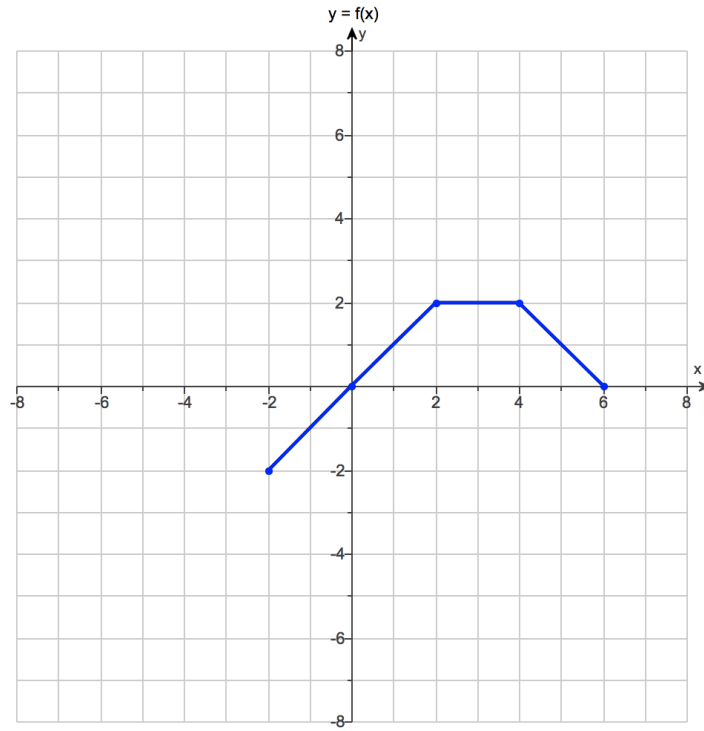
## Part II

4. Graph the function  $f(x) = \begin{cases} \sqrt{-x} & , x < -1 \\ x^2 & , -1 \leq x \leq 2 \\ x - 2 & , x > 2 \end{cases}$ . Plot at least two points on each branch.



5. Find the difference quotient,  $\frac{f(x+h)-f(x)}{h}$ , for  $f(x) = \frac{2}{x+1}$ .

6. 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.

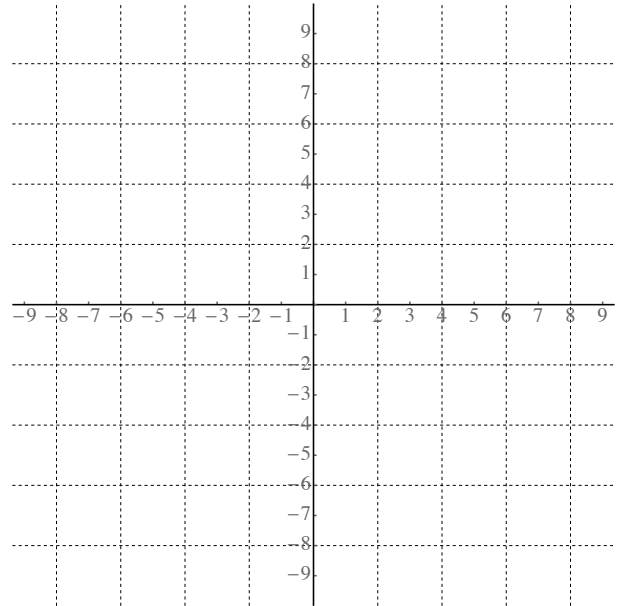
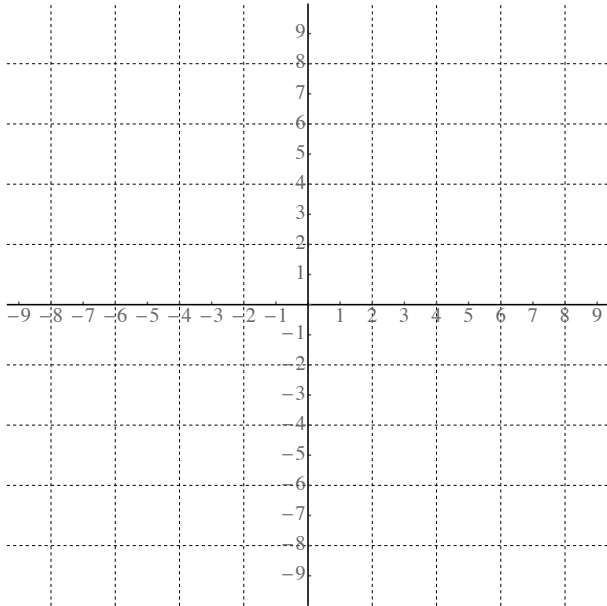


(i) transformation:

(ii) transformation:

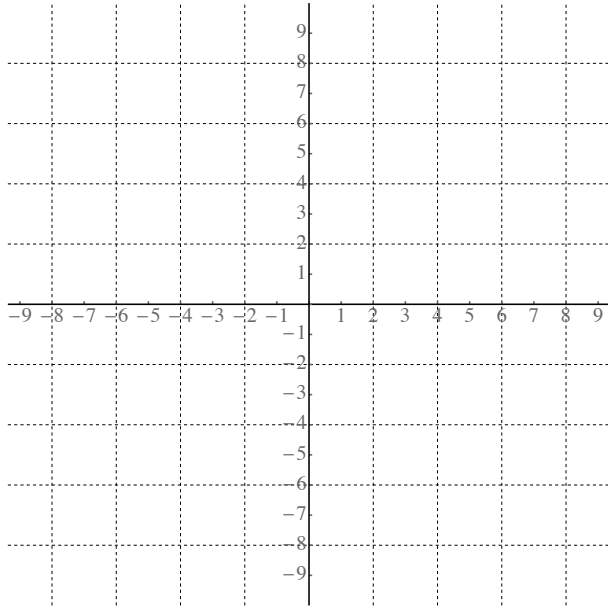
y=

y=



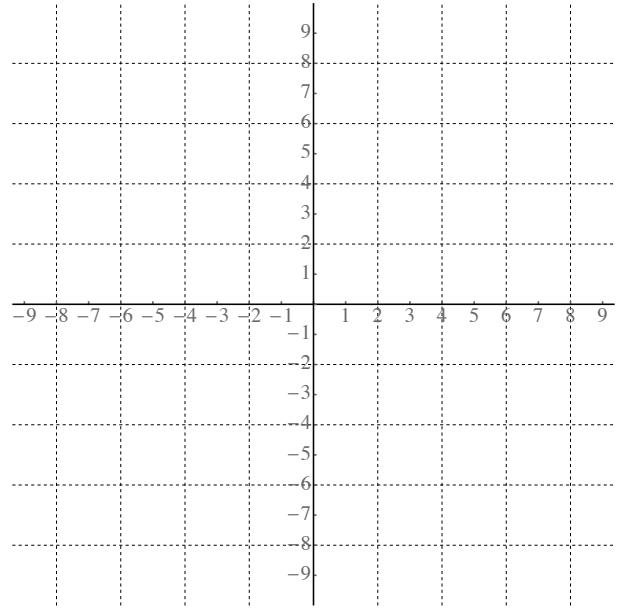
(iii) transformation:

y=



(iv) transformation:

y=



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

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

Use the page if you need additional space.