Exam #1, ver. A

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

   (a) $2x + 6$

   (b) $\dfrac{2}{3x + 4}$

   (c) $\dfrac{2x}{3x + 4}$

   (d) $\dfrac{2x}{x + 3}$

   (e) None of the above

   The domain of $f \circ g$ is
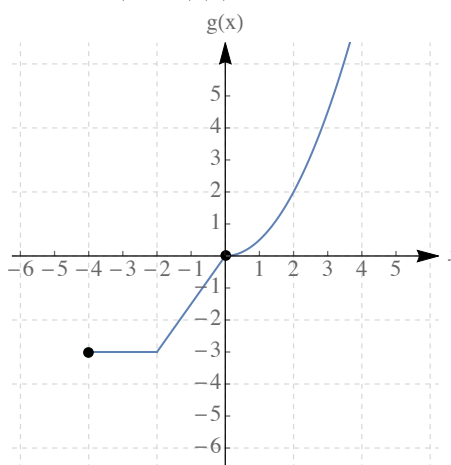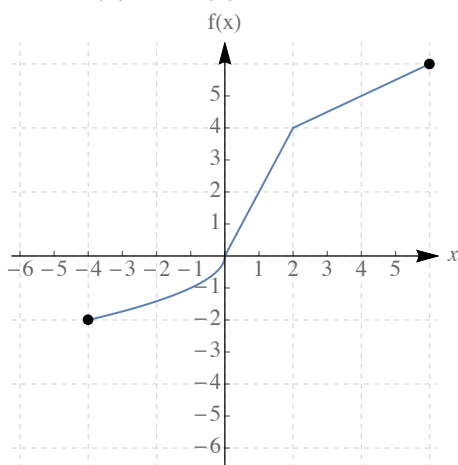
   (a) $(-\infty, -3) \cup (-3, \infty)$
   (b) $(0, \infty)$
   (c) $(-\infty, -4/3) \cup (-4/3, \infty)$
   (d) $(-\infty, \infty)$
   (e) None of the above.

2. The graphs of $f(x)$ and $g(x)$ are given below. The value of $(f - g)(2)$ 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.)
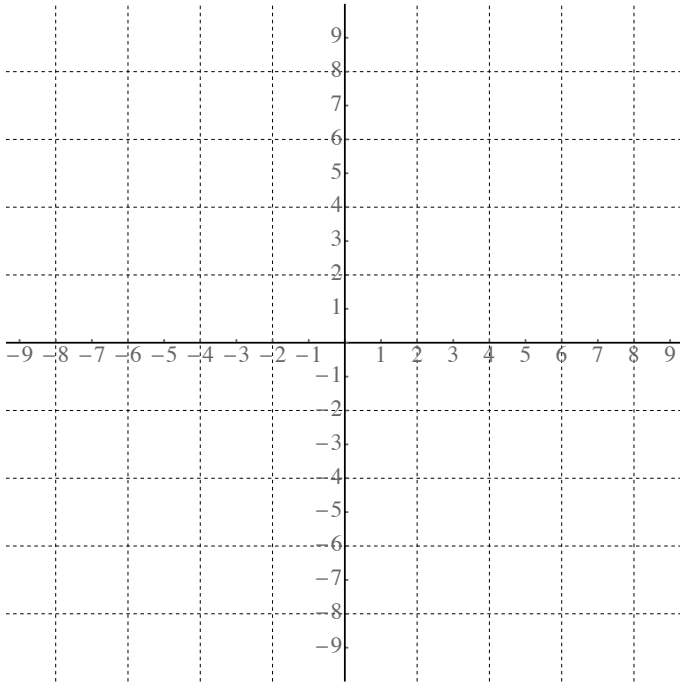
   (a) $f^{-1}(-3) = -12$
   (b) f is even
   (c) $(12, -3)$ is on the graph of the graph of f
   (d) $(1, -3)$ is on the graph of $y = f(12x)$
   (e) None of the above.
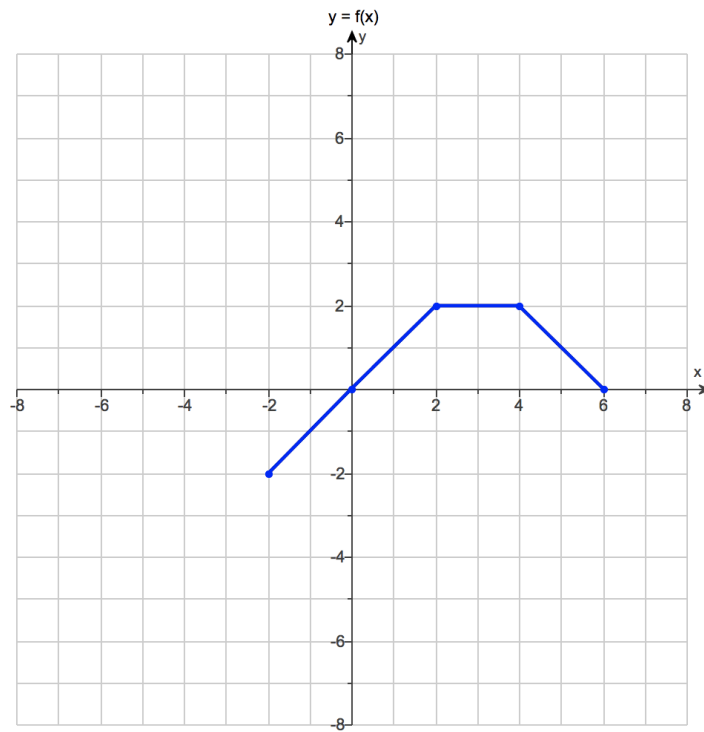
Part II

4. Graph the function $f(x) = \begin{cases} \sqrt{3-x} & , x < -1 \\ x+2 & , -1 \le x \le 2 \\ x^2 & x > 2 \end{cases}$. Plot at least two points on each branch.

5. Find the difference quotient, $\frac{f(x+h)-f(x)}{h}$, for $f(x) = \dfrac{4}{x+3}$.

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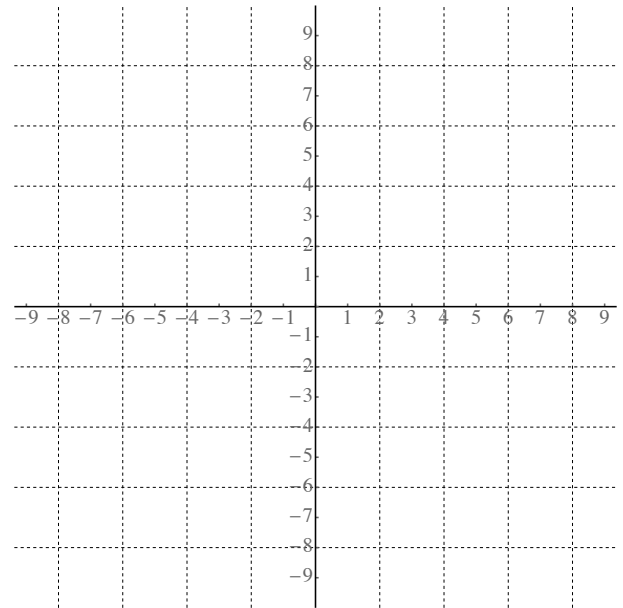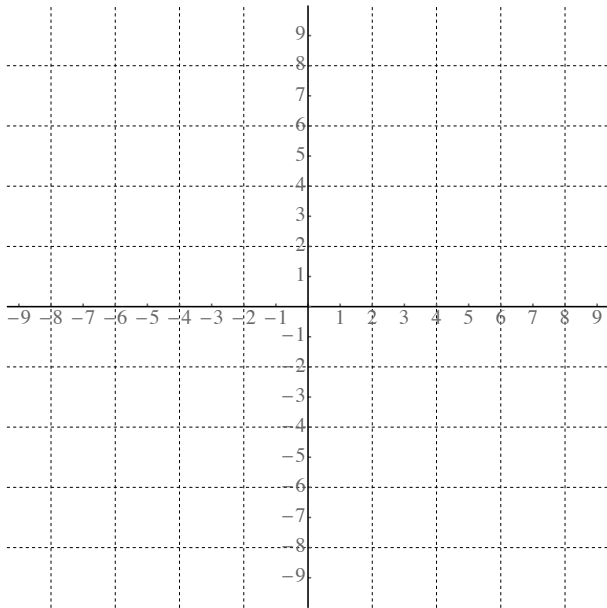
y = f(x)

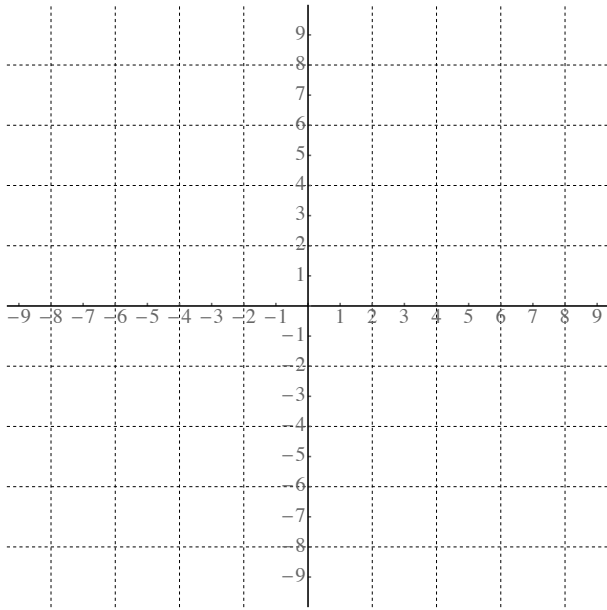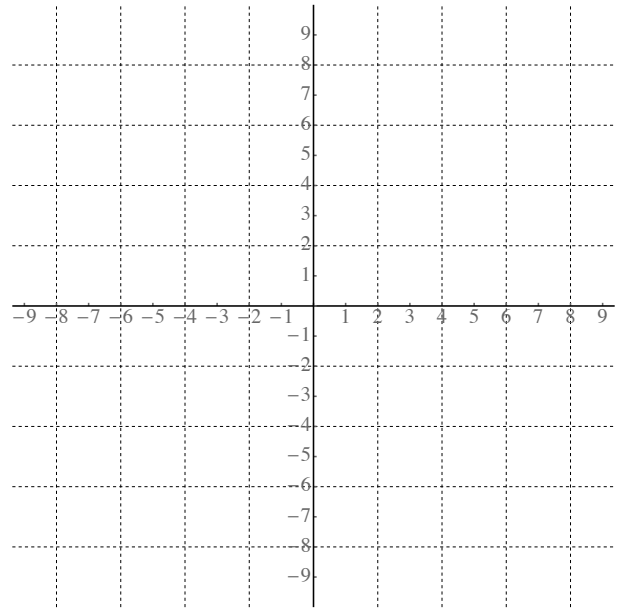(i) transformation:

y=

(ii) transformation:

y=

(iii) transformation:

y=

(iv) transformation:

y=

7. Find the inverse of $f(x) = \frac{5}{x} + 1$

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

Use the page if you need additional space.