

## C 03 MORE Chapter 1 Practice Questions

### PREC 12 – Reviewing 1.0-1.2

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1. Describe how the graph of the second function compares to the graph of the first function:

a)  $y = x^5$   
 $y = x^5 - 4$

b)  $y = 8x + 2$   
 $y = 8(x - 5) + 2$

c)  $y = |x|$   
 $y = |x - 5| + 3$

2. Write the new equation obtained after:

a)  $y = x^2$  is translated 6 units to the left

b)  $y = 5^x$  is translated 3 units right

c)  $y = \log(x)$  is translated 6 units left and 2 units up

3. The function  $y = f(x)$  is transformed to become  $y - 5 = f(x + 4)$ . If the point  $(-2, 6)$  lies on the graph of  $y = f(x)$  what is its **image point** on the graph of  $y - 5 = f(x + 4)$ ?

4. What is the domain for each of the following functions?

a)  $y = \frac{5}{3x+1}$

b)  $y = \sqrt{2x-8}$

5.  $y = f(x)$  contains the point  $(12, 24)$ . It is changed as follows. What is the image point in each case?

a)  $y = f(-x)$

b)  $y = -f(x)$

c)  $x = f(y)$

d)  $y = f(8x)$

e)  $y = f\left(\frac{1}{2}x\right)$

f)  $y = \frac{1}{2}f(x)$

g)  $y = 6f(x)$

h)  $2y = f(4x)$

6. For each part below, describe how the graph of the second function compares to the graph of the first function:

a)  $y = x^5$

b)  $y = x^2$

$y = 3x^5$

$y = (4x)^2$

c)  $y = |x|$

d)  $y = \frac{1}{x}$

$y = \left| \frac{1}{2}x \right|$

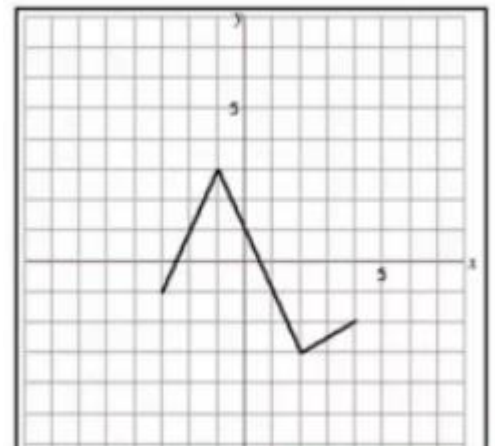
$4y = \frac{1}{x}$

7. The function  $y = f(x)$  is transformed to  $3y = f(x)$ . If the point  $(-12, 12)$  lies on the graph of  $y = f(x)$ , what is its **image point** on the graph of  $3y = f(x)$ ?

8. The function  $y = f(x)$  is transformed to  $y = f\left(-\frac{1}{2}x\right)$ . If the point  $(-2, 4)$  lies on the graph of  $y = f(x)$ , what is its **image point** on the graph of  $y = f\left(-\frac{1}{2}x\right)$ ?

9a) List each change that will happen in the graph, when the equation  $y = f(x)$  is changed to  $y = 2f\left(-\frac{1}{2}x\right)$ .

b) The graph of  $y = f(x)$  is shown on the grid. Sketch the graph of  $y = 2f\left(-\frac{1}{2}x\right)$  on the same grid.



## REVIEW OF 1.3-1.4, AND DOMAIN/RANGE

1. Suppose that the graph of  $y = f(x)$  contains the point  $(24, 4)$ . Find the *image point* under each of the following transformations:

a)  $y = -2f(3(x+2))+7$

b)  $y = f(8x-16)+2$

2. A function,  $y = g(x)$ , has domain  $\{x \mid 5 \leq x \leq 9, x \in \mathfrak{R}\}$  and range  $\{y \mid -4 \leq y \leq 12, y \in \mathfrak{R}\}$ .

a) What is the domain of the inverse of  $g(x)$ ?

b) What is the range of the inverse of  $g(x)$ ?

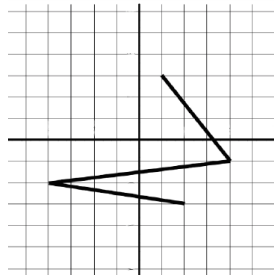
3. State the domain for each of the following. Remember that division by zero is undefined and that we cannot take square roots of negative numbers – this should help you figure out the domains.

a)  $f(x) = \frac{5}{x-3}$

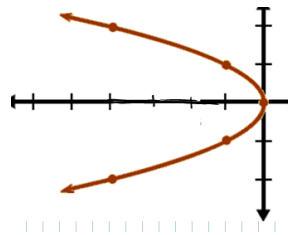
b)  $f(x) = \sqrt{18-2x}$

4. State the domain and range for each of the following:

a)



b)



5. What is the equation of the inverse of  $f(x) = 3x+12$  ?

**PREC12 Chapter 1 Practice Test**

1. If  $y$  is replaced by  $y + 3$  in a function, then the graph of the new function will be:

- A. translated up 3  
 B. translated down 3  
 C. vertically stretched, factor 3  
 D. vertically stretched, factor  $\frac{1}{3}$

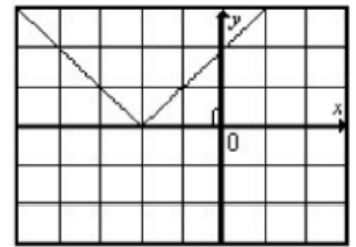
2. The point  $(3, 5)$  is on the graph of the function  $y = f(x)$ . The point  $(0, 6)$  is on the graph of the function  $y = f(x - a) + b$ . What are the values of  $a$  and  $b$  ?

- A.  $a = 3, b = 1$   
 B.  $a = 3, b = -1$   
 C.  $a = -3, b = 1$   
 D.  $a = -3, b = -1$

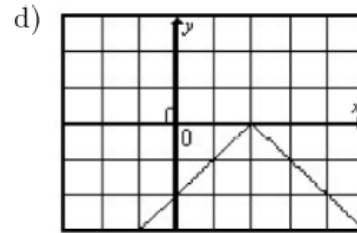
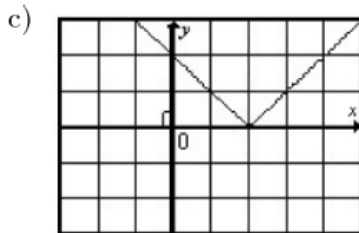
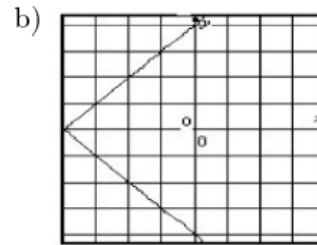
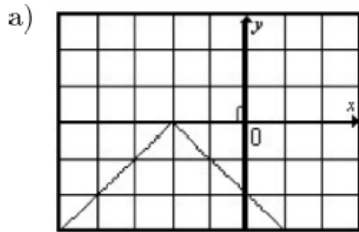
3. Which equation will move the graph of  $y = x^2$  three units to the left?

- A.  $y - 3 = x^2$   
 B.  $y = x^2 - 3$   
 C.  $y = (x - 3)^2$   
 D.  $y = (x + 3)^2$

4. The graph of  $y = g(x)$  is given at right.



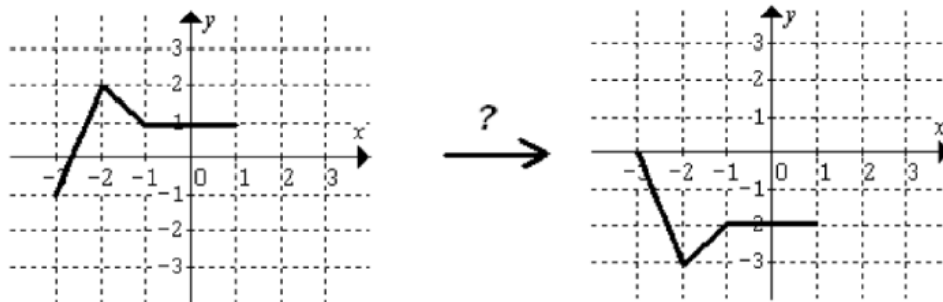
A graph of  $y = -g(x)$  would appear as which graph below?



5. In which line is  $y = 2x^2 - 3x$  reflected to obtain  $x = 2y^2 - 3y$  ?

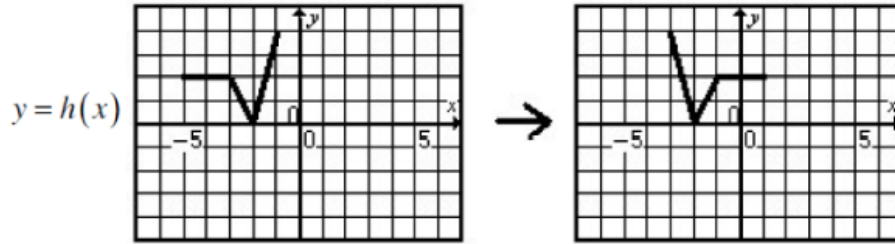
- A.  $y = x$   
 B.  $x$ -axis  
 C.  $y$ -axis  
 D. both  $x$ -axis and  $y$ -axis

6. If  $y = f(x)$  is transformed to  $y = f(-x)$ , any *invariant points* will lie on:
- A. the  $x$ -axis  
B. the  $y$ -axis  
C. the line  $y = x$   
D. there are no invariant points
7. The point  $(7, -4)$  is on the graph of the function  $y = f(x)$ . Which point must be on the graph of the function  $y = -2f(x)$ ?
- A.  $(7, -8)$   
B.  $(7, 8)$   
C.  $(7, -2)$   
D.  $(7, 2)$
8. What value of  $a$  in the equation  $y = \sqrt{ax}$  will cause a horizontal stretch, factor  $\frac{1}{3}$ ?
- A.  $a = \frac{1}{3}$   
B.  $a = 3$   
C.  $a = -\frac{1}{3}$   
D.  $a = -3$
9. If  $y = f(x)$  is compared to  $y = f(3x - 6)$ , what transformations have occurred?
- A. horizontal stretch factor  $\frac{1}{3}$ , right 6 units  
B. horizontal stretch factor  $\frac{1}{3}$ , right 2 units  
C. horizontal stretch factor 3, right 2 units  
D. horizontal stretch factor 3, right 6 units
10. The graph of  $y = f(x)$  is given below. What transformations will produce the new image?



- A. reflect in the  $x$ -axis and shift down one  
B. reflect in the  $x$ -axis and shift up one  
C. reflect in the  $y$ -axis and shift down one  
D. reflect in the  $y$ -axis and shift up one

11. The graph of  $y = h(x)$  is shown below. What new equation will produce the graph of the transformed function?

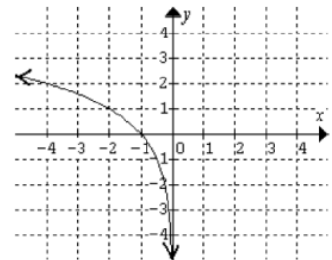


- A.  $-y = h(x + 4)$
- B.  $y = h(-x)$
- C.  $y = h(-(x + 4))$
- D.  $y = h(-(x - 4))$

12. The point  $(a, b)$  is on the graph of  $y = f(x)$ . Which point must be on the graph of  $y + 2 = 3f(-x)$ ?

- A.  $(-a, 3b - 2)$
- B.  $(-a, 3(b - 2))$
- C.  $\left(-a, \frac{b - 2}{3}\right)$
- D.  $\left(-a, \frac{b}{3} - 2\right)$

13. Identify the graph of the *inverse* for the function shown at right.



- a)
- b)
- c)
- d)

14. Find  $y = f^{-1}(x)$  if  $f(x) = x^3 + 4$ .

A.  $f^{-1}(x) = x^3 - 4$

B.  $f^{-1}(x) = \frac{1}{x^3 + 4}$

C.  $f^{-1}(x) = \sqrt[3]{x} - 4$

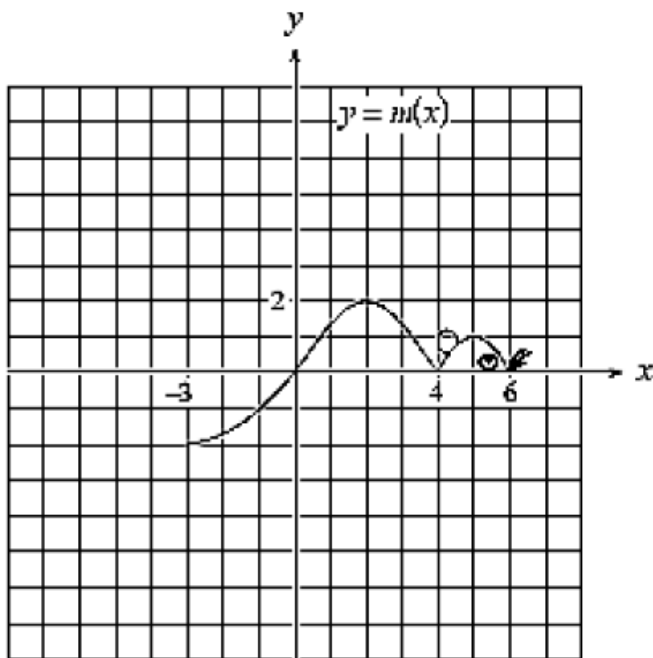
D.  $f^{-1}(x) = \sqrt[3]{x-4}$

15. Calvin is asked what steps would be required to graph  $y = f(2x + 6)$  if he is given the graph of  $y = f(x)$ . He writes that the function needs to be vertically stretched by a factor of  $\frac{1}{2}$  and then translated right 6 units. What mistakes did he make?

16. Omitted

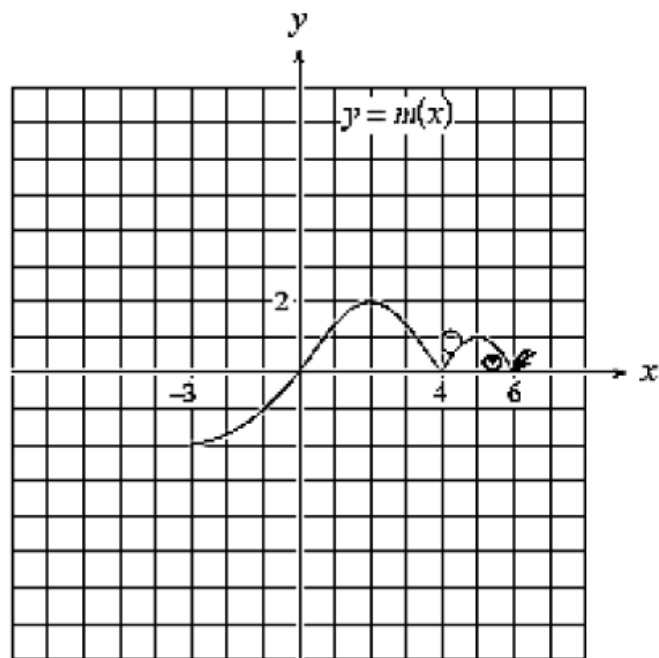
17. Given the graph of  $y = m(x)$  below, below,

draw the graph of  $y + 3 = m(x - 1)$ .

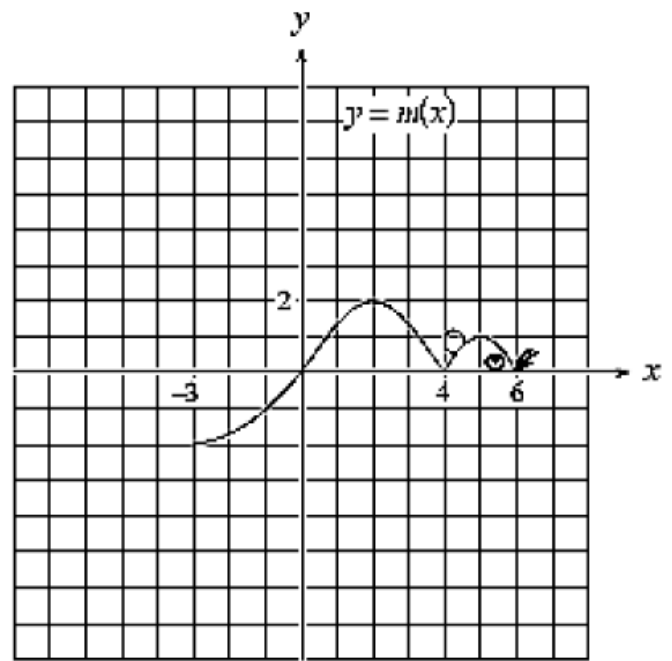


18. Given the graph of  $y = m(x)$

draw the graph of  $\frac{1}{2}y = m(-x)$ .



19. Given the graph of  $y = m(x)$  at right, draw the graph of  $y = m(-x + 2)$ .



20. Given the function  $y = (x - 3)^2 - 2$

a) Graph the function on the grid.

b) Determine the domain of this function.

c) Determine the range of this function.

d) Graph the *inverse* of this function.

e) How could you restrict the domain of  $y = (x - 3)^2 - 2$  so that its inverse will also be a function?

f) Algebraically, determine the equation of the inverse of  $y = (x - 3)^2 - 2$ .

