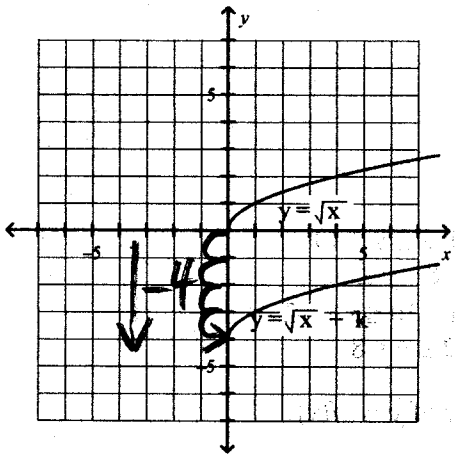
NAME: _____ BLOCK: ____ DATE: _____

PMATH 12 - CHAPTER 3 - PRETEST **signature**

Multiple Choice - PART 1 - NON-CALCULATOR - 10 MINUTES (#1-6)
*CIRCLE the choice that **best** completes the statement or answers the question.*

1. The graph of $y = \sqrt{x} + k$ is the image of the graph of $y = \sqrt{x}$ after a single translation. What is the value of k?



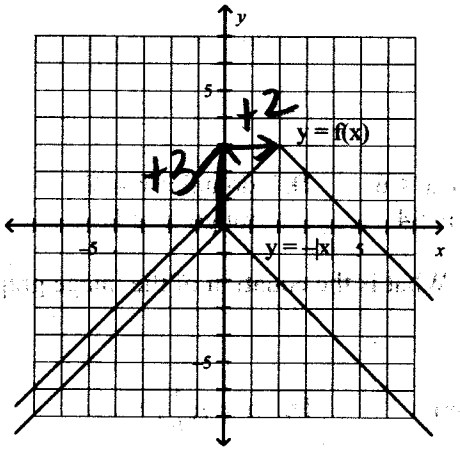
A. 5 **B.** –4 C. 4 D. –5

2. The graph of $y = f(x)$ is translated 4 units down. What is the equation of the translation image in terms of the function f?

$y = f(x) - 4$

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

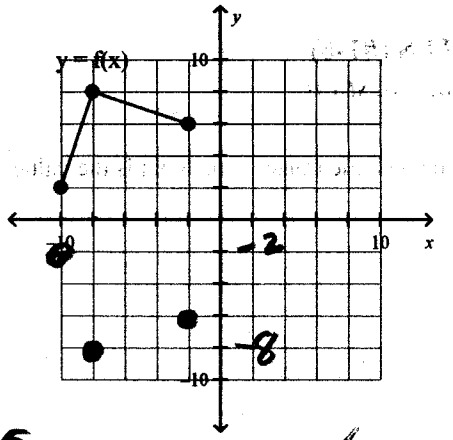
3. The graph of $y = f(x)$ is the image of the graph of $y = -|x|$ after a horizontal and vertical translation. What is an equation of the image graph?



$y = -|x-2| + 3$

A. $y-3 = -|x|$ **B.** $y-3 = -|x-2|$ C. $y-3 = |x+2|$ D. $y-2 = -|x-3|$

4. Here is the graph of $y = f(x)$. What are the domain and range of its image after a reflection in the x-axis?



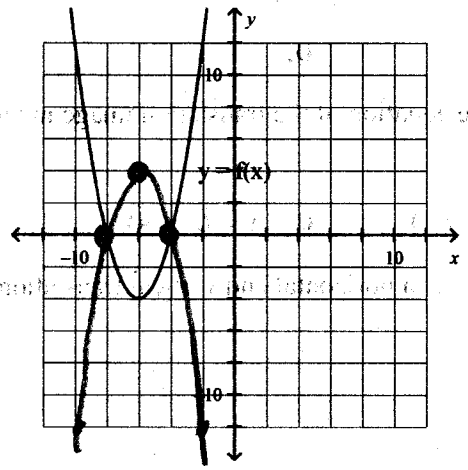
(A) domain: $-10 \le x \le -2$ ✓
range: $-8 \le y \le -2$ ✓

B. domain: $2 \le x \le 10$
range: $2 \le y \le 8$ ✗

C. domain: $2 \le x \le 10$
range: $-8 \le y \le -2$ ✓

D. domain: $-10 \le x \le -2$
range: $2 \le y \le 8$ ✗

5. Here is the graph of $y = f(x)$. What are the domain and range of $y = -f(x)$?



A. domain: $x \in \mathbb{R}$ ✓
range: $y \le -4$

(B.) domain: $x \in \mathbb{R}$ ✓
range: $y \le 4$ ✓

C. domain: $x \le$ ✗
range: $y \ge 4$

D. domain: $x \in \mathbb{R}$ ✓
range: $y \in \mathbb{R}$

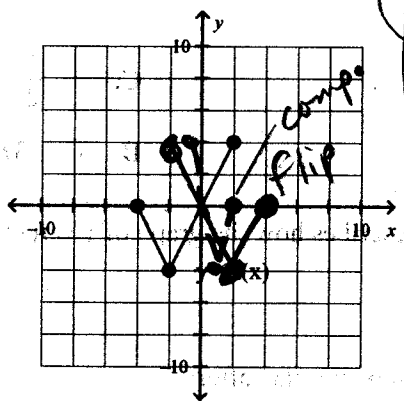
6. The graph of $y = f(x)$ is stretched vertically by a factor of 6. What is the equation of the image graph in terms of the function f?

(A.) $y = 6f(x)$ B. $y = \frac{1}{6}f(x)$ C. $y = f(6x)$ D. $y = f(\frac{1}{6}x)$

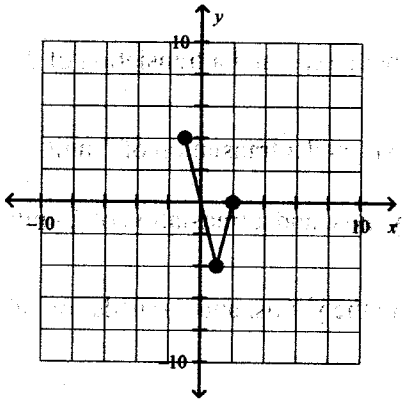
MULTIPLE CHOICE - PART 2 - CALCULATOR may be used after 10 minutes

7. For the graph of $y = f(x)$ shown below, which graph represents $y = f(-2x)$?

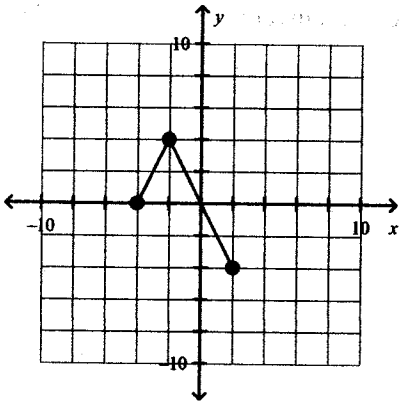
flip over y axis
Compress x



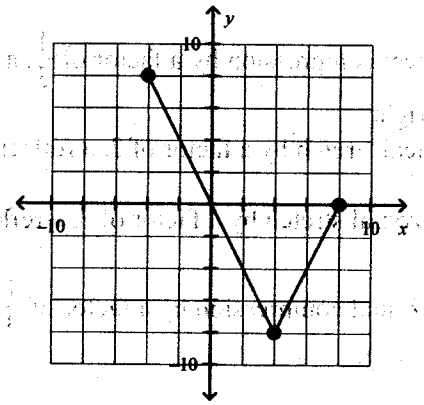
A.



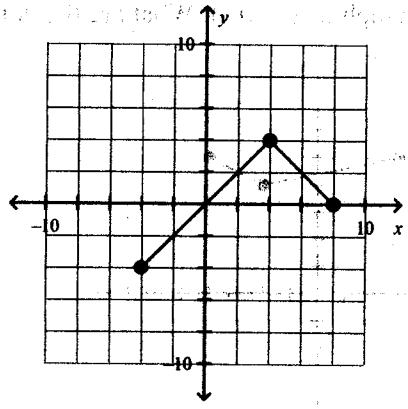
B.



C.



D.



8. The point A (16,64) lies on the graph of $y = \sqrt{x^3}$. What are the coordinates of its image A′ on the graph of $y = \frac{1}{4}\sqrt{(2x)^3}$?

$\frac{1}{4}(y)$ $\frac{1}{2}(x)$

A. (8,16)
B. (8,32)
C. (4,16)
D. Not enough information is given.

9. The graph of $y = f(x)$ is horizontally compressed by a factor of $\frac{1}{3}$, vertically compressed by a factor of $\frac{1}{2}$, and reflected in the y-axis. What is an equation of the image graph in terms of the function f?

A. $y = \frac{1}{2}f(-3x)$

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

C. $y = f(x - 3)$

D. $y = -3f(\frac{1}{2}x)$

10. Which statement below describes how the graph of $y = f(x)$ has been transformed to get the graph of $y = f(-\frac{1}{3}(x-2))$?

It is the image of the graph of $y = f(x)$ after:

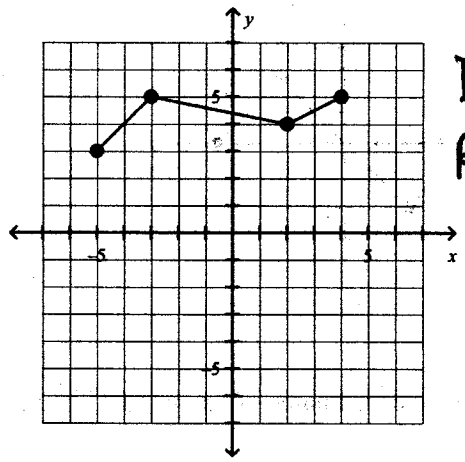
A. a vertical compression by a factor of $\frac{1}{3}$, a reflection in both axes, and a translation of 2 units right.

B. a vertical stretch by a factor of 3, a reflection in the y-axis, and a translation of 2 units down.

C. a horizontal stretch by a factor of 3, a reflection in the y-axis, and a translation of 2 units right.

D. a horizontal compression by a factor of $\frac{1}{3}$, a reflection in the y-axis, and a translation of 2 units right.

11. Here is the graph of $y = f(x)$. What are the domain and range of its inverse?



D $-5 \to 4$ → new range

R $3 \to 5$ — new domain

A. Domain: $-5 \le x \le 4$
Range: $-5 \le y \le -3$

B. Domain: $3 \le x \le 5$
Range: $-5 \le y \le 4$

C. Domain: $-5 \le x \le 4$
Range: $3 \le y \le 5$

D. Domain: $3 \le x \le 5$
Range: $-4 \le y \le 5$

12. Determine an equation of the inverse of the function $y = -6x - 5$.

$x = -6y - 5$

$\frac{x+5}{-6} = y$

A. $y = \frac{x-6}{-5}$

B. $y = \frac{x-5}{-6}$

C. $y = -6x + 5$

D. $y = \frac{x+5}{-6}$

13. The point A(–5,–3) lies on the graph of $y = f(x)$. What are the coordinates of its image A′ on the graph of $y = f^{-1}(x)$?

A. (3,5)

B. (5,3)

C. (–3,–5)

D. (–5,–3)

Short Answer - Show your work

1. The graph of $y = f(x)$ has x-intercepts 2 and 5, and y-intercept –2. After a reflection in the y-axis, what are the x-intercepts and y-intercept of the image graph?

$x\text{int} \rightarrow -2, -5$

$y\text{int} \rightarrow -2$

2. The graph of $y = f(x)$ is compressed horizontally by a factor of $\frac{4}{9}$, stretched vertically by a factor of $\frac{9}{8}$, and reflected in the y-axis. What is the equation of the image graph in terms of the function f?

$y = \frac{9}{8} f\left(-\frac{9}{4}x\right)$

3. The graph of $y = \sqrt{x}$ is vertically compressed by a factor of $\frac{1}{5}$, horizontally compressed by a factor of $\frac{1}{3}$, reflected in both axes, then translated 2 units left and 4 units up. Write an equation of the image graph in terms of x.

$y = -\frac{1}{5}\left(\sqrt{-3(x+2)}\right) + 4$

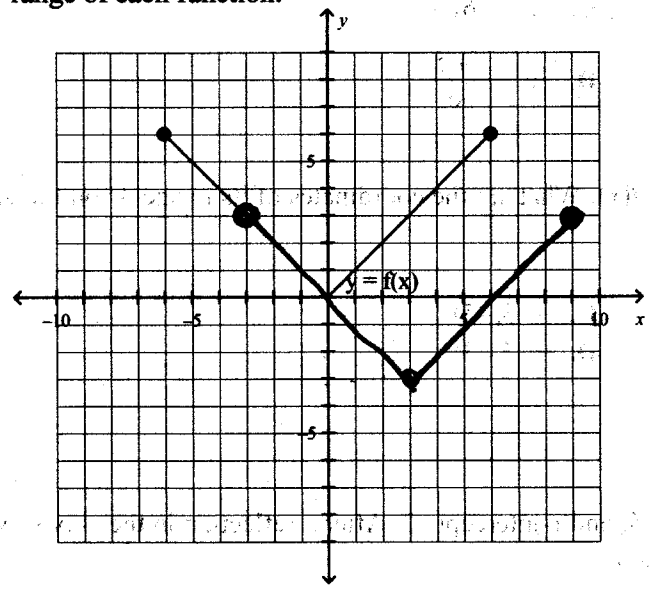
4. Determine an equation of the inverse of the function $y = -5x^2 + 4$.

$x = -5y^2 + 4$

$\pm\sqrt{\frac{x-4}{-5}} = y$

Problem - Show your work

1. Here is the graph of $y = f(x)$. On the same grid, sketch the graph of $y + 3 = f(x - 3)$. State the domain and range of each function.



$y = f(x-3) - 3$

$\rightarrow 3 \quad \downarrow 3$

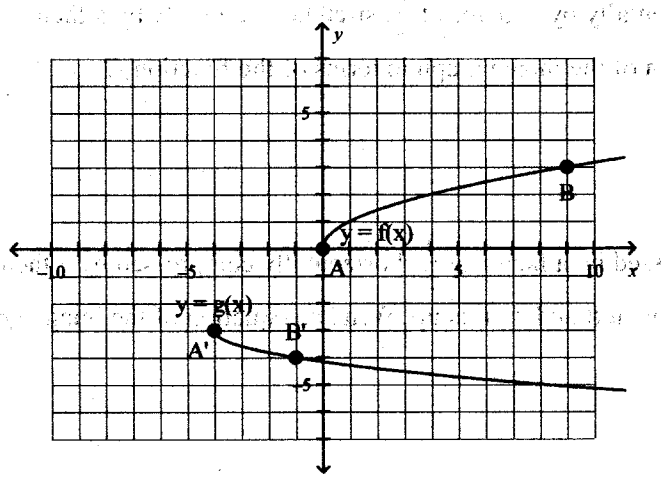
$f(x) \rightarrow D \rightarrow -6 \le x \le 6$

$R \rightarrow 0 \le y \le 6$

$f'(x) \Rightarrow D \rightarrow -3 \le x \le 9$

$R \rightarrow -3 \le y \le 3$

2. The graph of $y = g(x)$ is the image of the graph of $y = f(x)$ after a combination of transformations. Corresponding points are labelled. What is an equation of the image graph in terms of the function f?



$A(0,0) \quad B(9,3)$

hor -9, vert -3, $\frac{1}{3}$

$A'(-4,-3) \quad B'(-1,-4)$

hor -3, $\frac{1}{3}$, vert -1

$a = \frac{1}{3} \quad b = 3$

$(\frac{x}{3}, -\frac{1}{3}y)$

$B(9,3) \rightarrow (\frac{9}{3}, -\frac{1}{3}(3))$

$(3,-1) \longrightarrow (-1,-4)$

-4 hor shift, -3 vert shift

$$y = -\frac{1}{3} f(3(x+4)) - 3$$