

**Mathematics 3200**  
**Test Unit 2**

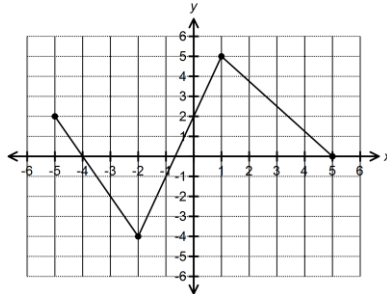
Name: \_\_\_\_\_

**Part A :** Place the letter corresponding to the correct answer to each of the following on the blank at the right.

1. Which is true for the function  $y + 3 = f(2x + 8)$  when compared to  $y = f(x)$  ? 1. \_\_\_\_

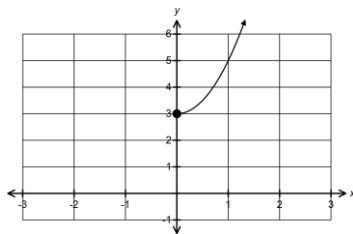
	Horizontal Translation	Vertical Translation
A)	8 Left	3 Down
B)	4 Left	3 Down
C)	4 Right	3 Up
D)	8 Right	3 Up

2. Given the graph of  $y = g(x)$ , what is the range? 2. \_\_\_\_



- (A)  $[-5, 5]$     (B)  $[-4, 5]$   
(C)  $(-5, 5)$     (D)  $(-4, 5)$

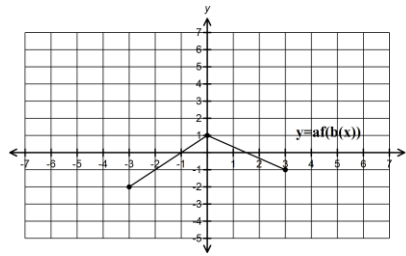
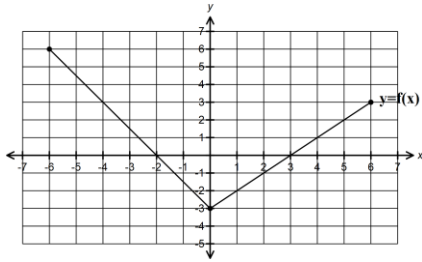
3. Given the graph of  $f(x) = x^2 + 3$  below, what is the domain of  $f^{-1}(x)$  ? 3. \_\_\_\_



- (A)  $\{x / x \geq 0, x \in R\}$     (B)  $\{x / x \geq 3, x \in R\}$   
(C)  $\{y / y \geq 0, y \in R\}$     (D)  $\{y / y \geq 3, y \in R\}$

4. What is the vertical stretch factor of  $y = a(f(b(x)))$  when compared to  $y = f(x)$ ?

4. \_\_\_\_



(A)  $-\frac{1}{2}$

(B)  $-\frac{1}{3}$

(C)  $\frac{1}{3}$

(D)  $\frac{1}{3}$

5. What is the correct order of transformations for the graph of  $y = 2(f(-3(x-1)))$  when compared to  $y = f(x)$ ?

5. \_\_\_\_

- (A) • Stretched vertically by a factor of 2 about the x axis
  - Stretched horizontally by a factor of 3 about the y axis
  - Reflected in the y axis
  - Horizontal translation of 1 unit right
- (B) • Horizontal translation of 1 unit right
  - Stretched vertically by a factor of 2 about the x axis
  - Stretched horizontally by a factor of  $\frac{1}{3}$  about the y axis
  - Reflected in the y axis
- (C) • Stretched vertically by a factor of 2 about the x axis
  - Stretched horizontally by a factor of  $\frac{1}{3}$  about the y axis
  - Reflected in the y axis
  - Horizontal translation of 1 unit right
- (D) • Stretched vertically by a factor of  $\frac{1}{2}$  about the x axis
  - Stretched horizontally by a factor of  $\frac{1}{3}$  about the y axis
  - Reflected in the x axis
  - Horizontal translation of 1 unit right

6. Which mapping notation transforms  $y = f(x)$  into  $y = \frac{1}{2}f(-2(x+4)) + 6$  ? 6. \_\_\_\_

(A)  $(x, y) \rightarrow \left(-\frac{1}{2}x - 4, 2y + 6\right)$

(B)  $(x, y) \rightarrow (-2x + 4, 2y + 6)$

(C)  $(x, y) \rightarrow \left(-\frac{1}{2}x - 4, \frac{1}{2}y + 6\right)$

(D)  $(x, y) \rightarrow \left(-2x - 4, \frac{1}{2}y - 6\right)$

7. Given the function  $f(x) = 5x - 6$ , what is  $f^{-1}(x)$  ? 7. \_\_\_\_

(A)  $f^{-1}(x) = 5x - 6$

(B)  $f^{-1}(x) = \frac{1}{5}x + \frac{6}{5}$

(C)  $f^{-1}(x) = \frac{1}{5}x + 6$

(D)  $f^{-1}(x) = \frac{1}{5x - 6}$

8. The point  $(2, -3)$  is on the graph of  $y = f(x)$ , what is the image point for the transformation  $y + 1 = 2(f(x - 3))$  ? 8. \_\_\_\_

(A)  $(5, -7)$

(B)  $(1, -2)$

(C)  $(-2, -4)$

(D)  $(0, 3)$

9. Given the function  $f(x) = (x + 4)^2 - 6$ , which of the following restriction must be applied to  $f(x)$  so that  $f^{-1}(x)$  is a function? 9. \_\_\_\_

(A)  $\{x / x \geq 4, x \in \mathbf{R}\}$

(B)  $\{x / x \geq -4, x \in \mathbf{R}\}$

(C)  $\{x / x \geq -6, x \in \mathbf{R}\}$

(D)  $\{y / y \geq -6, y \in \mathbf{R}\}$

10. Given the function  $f(x) = 2x^2 + 10$ , what is  $f^{-1}(x)$ ? 10. \_\_\_\_

(A)  $f^{-1}(x) = \pm\sqrt{\frac{1}{2}x - 10}$

(B)  $f^{-1}(x) = \pm\sqrt{\frac{1}{2}x + 10}$

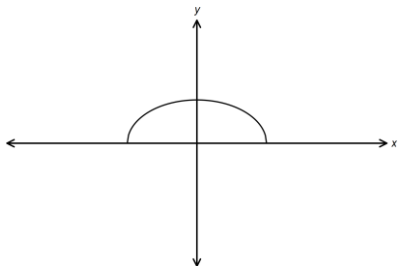
(C)  $f^{-1}(x) = \pm\sqrt{\frac{x - 10}{2}}$

(D)  $f^{-1}(x) = \pm\sqrt{\frac{x + 10}{2}}$

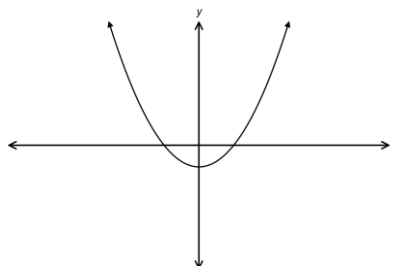
11. Which of the following functions has an inverse that is a function ?

11. \_\_\_\_

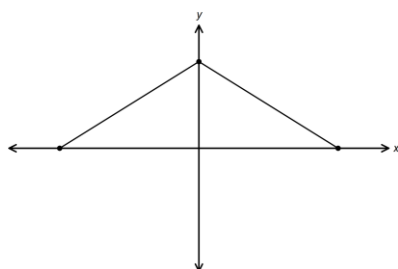
(A)



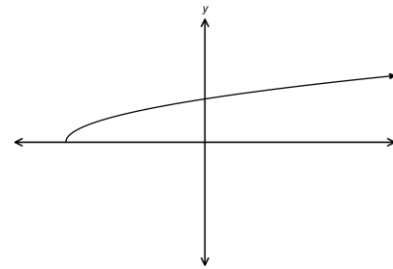
(B)



(C)

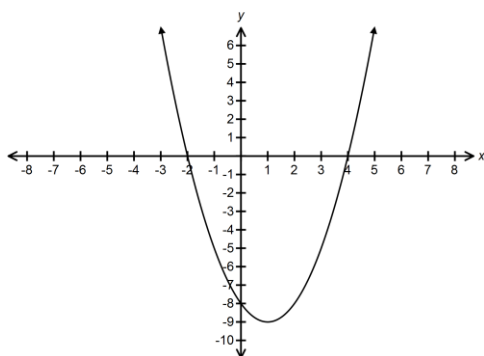


(D)



12. What are zeros of the function  $y = f(x)$  after the transformation of  $y = f(-2x)$ ?

12. \_\_\_\_



(A)  $\{-4, 8\}$

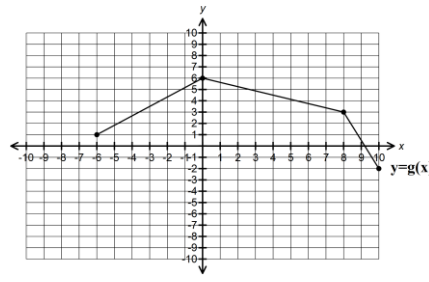
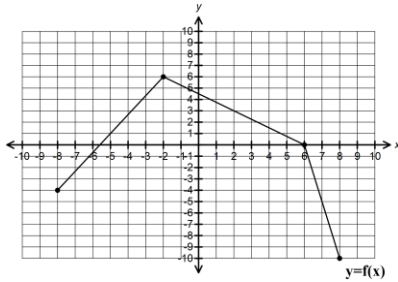
(B)  $\{-1, 2\}$

(C)  $\{4, -8\}$

(D)  $\{1, 2\}$

13. Which function best represents  $y = g(x)$  when compared to  $y = f(x)$ ?

13. \_\_\_\_



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

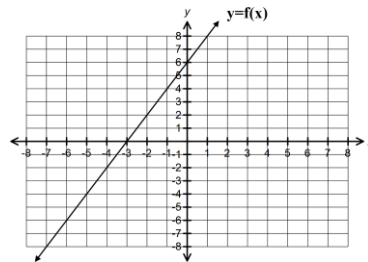
(B)  $y = \frac{1}{2} f(x-2) + 3$

(C)  $y = \frac{1}{2} f(x+2) - 3$

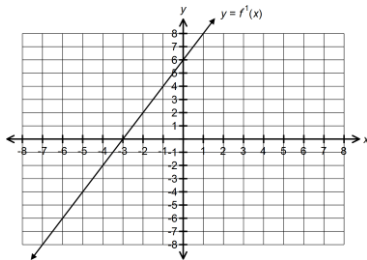
(D)  $y = \frac{1}{2} f(x-2) - 3$

14. Which of the following is the graph of the inverse of  $y = f(x)$ ?

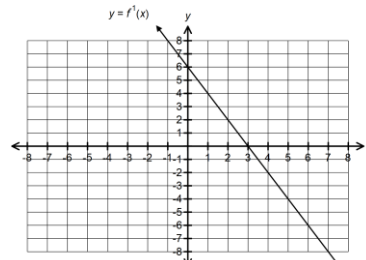
14. \_\_\_\_



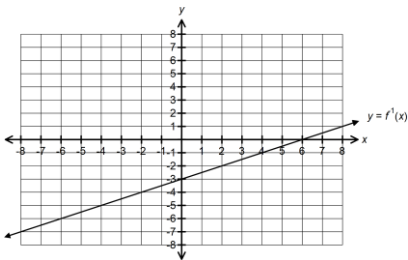
(A)



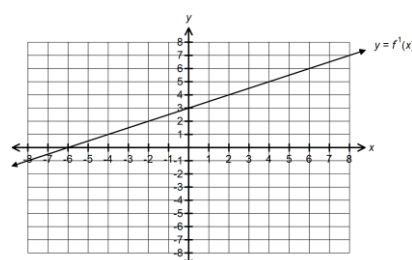
(B)



(C)



(D)



15. Which is true for the function  $y + 2 = -3f(4x + 8)$  when compared to  $y = f(x)$ ?

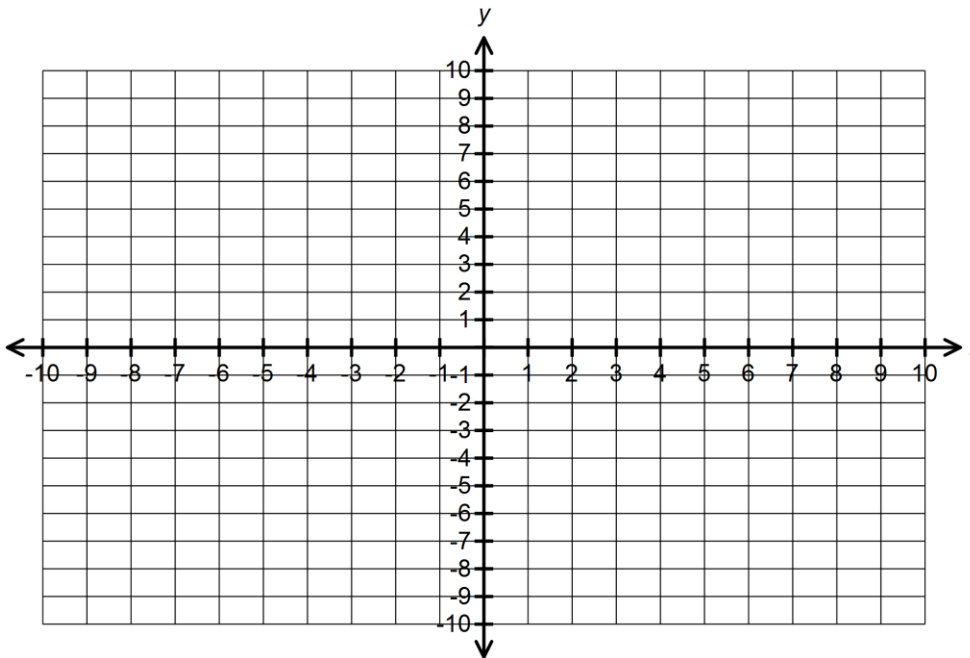
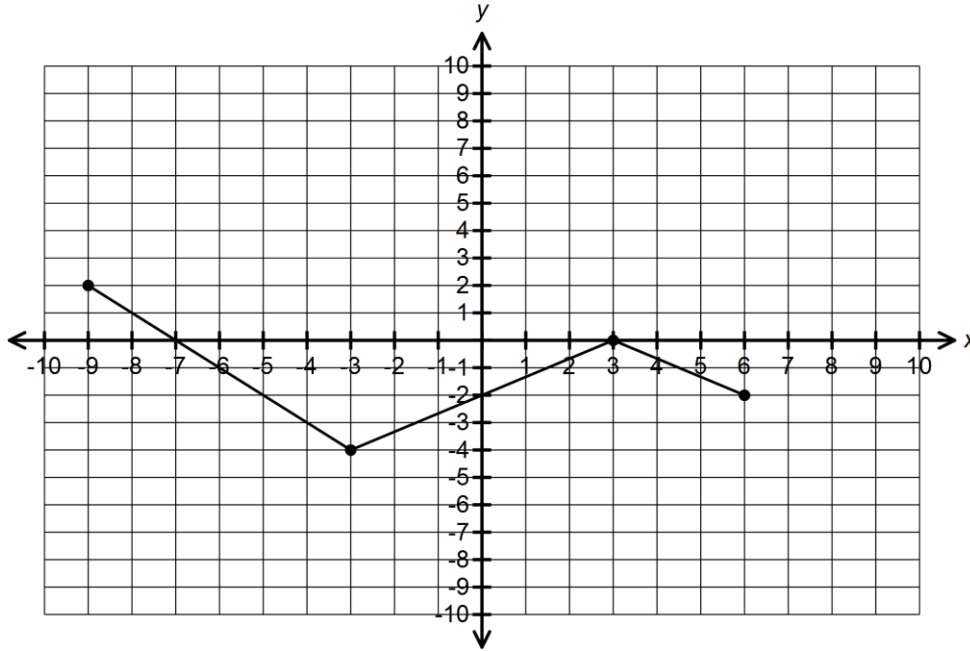
15. \_\_\_\_

	Horizontal Stretch Factor	Vertical Stretch Factor
(A)	$\frac{1}{4}$	-3
(B)	$\frac{1}{4}$	3
(C)	4	-3
(D)	4	$\frac{1}{3}$

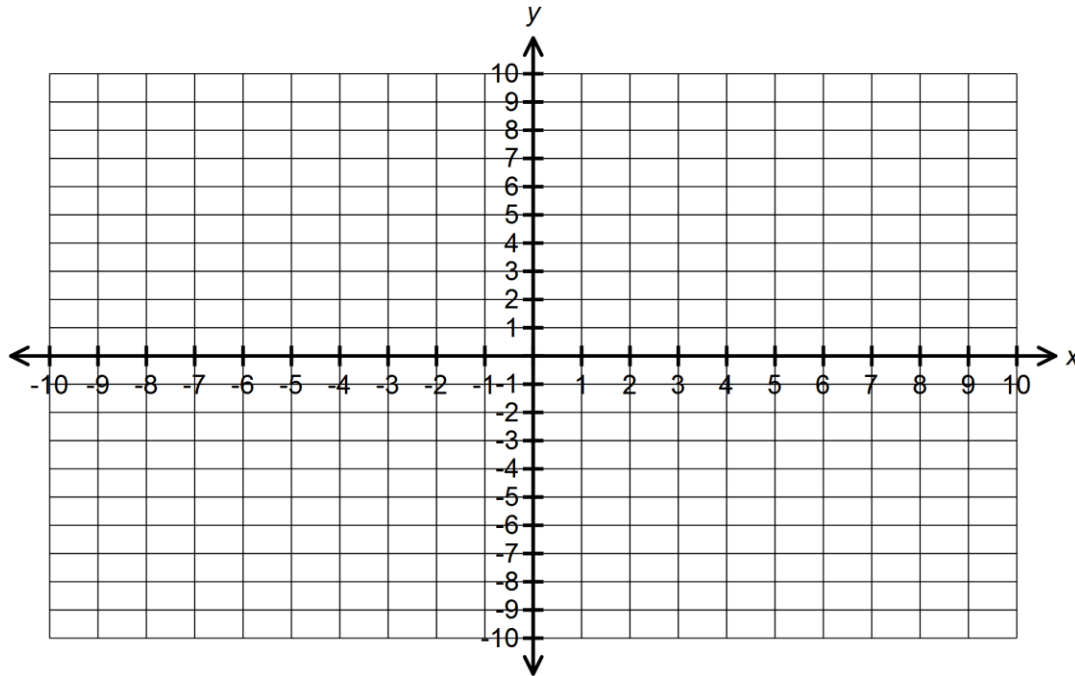
**Part B: Answer all questions and show your workings.**

1. Given the graph of the function  $y = f(x)$  shown, Sketch the graph of  $y = 2f(-3(x+1)) - 2$ .

**(4 marks)**

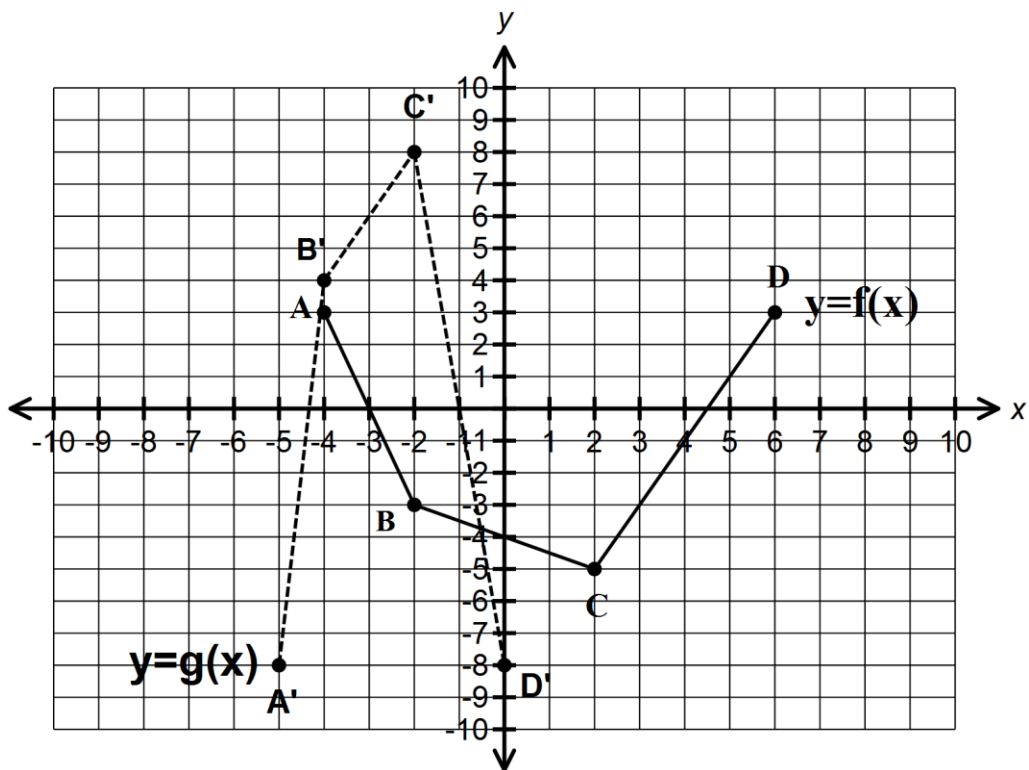


2. The graph of  $y = f(x)$  with points  $A(5, 3)$ ,  $B(3, 6)$ ,  $C(-1, -3)$  is transformed so that  $A'(-9, -1)$ ,  $B'(-5, 0)$ ,  $C'(3, -3)$ . Plot the points and determine the equation of the image function in the form  $y = a f(b(x-h)) + k$ . (4 marks)

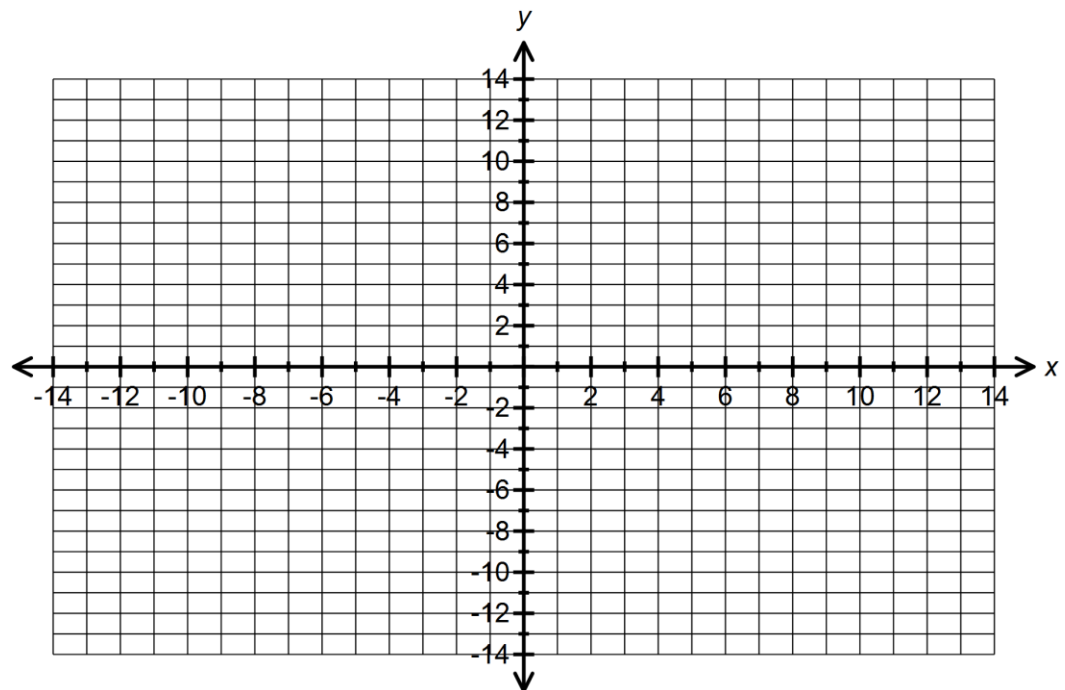
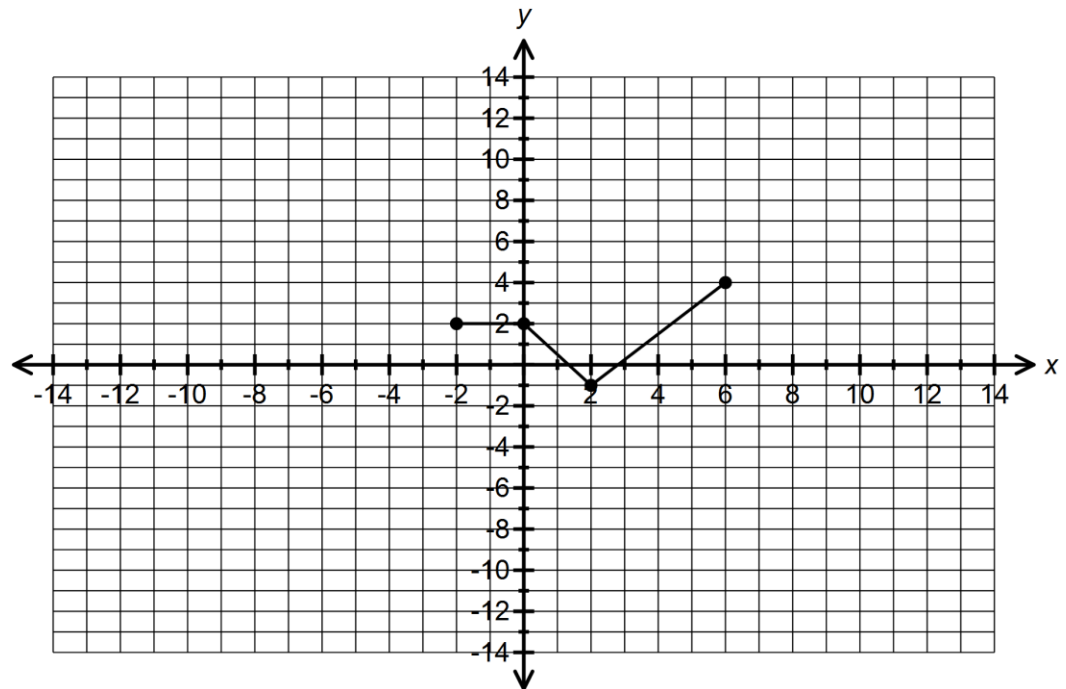




3. Determine the equation of  $y = g(x)$  when compared to  $y = f(x)$ . (3 marks)



4. Given the graph of the function  $y = f(x)$  below, sketch the graph of the inverse of  $y = 3f(-2(x-2))-1$ . (4 marks)



5. (a) If  $f(x) = 2x^2 + 12x + 11$ , what restriction could be placed on  $f(x)$  so that  $f^{-1}(x)$ ? **(2 marks)**

(b) Find  $f^{-1}(x)$  with the restricted domain for the equation in part (a). **(3 marks)**