Transformations Homework Booklet

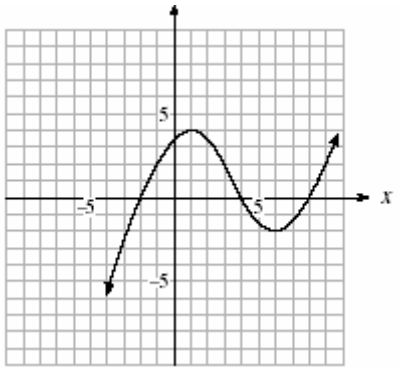
1. Which equation represents the graph of $y=\sqrt{x}$ after it is translated 4 units to the right?

A. $y=\sqrt{x}-4$ B. $y=\sqrt{x-4}$ C. $y=\sqrt{x+4}$ D. $y=\sqrt{x}+4$

2. If $f(x)=5x-1$, determine the equation of $f^{-1}(x)$, the inverse of $f(x)$.

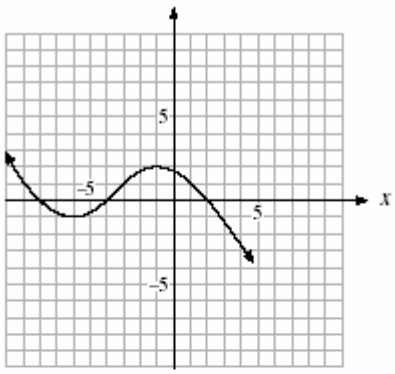
A. $f^{-1}(x)=\dfrac{1}{5x-1}$ B. $f^{-1}(x)=\dfrac{1}{5}x-1$ C. $f^{-1}(x)=\dfrac{x+1}{5}$ D. $f^{-1}(x)=\dfrac{x-1}{5}$

3. The graph of $y=f(x)$ is shown below.

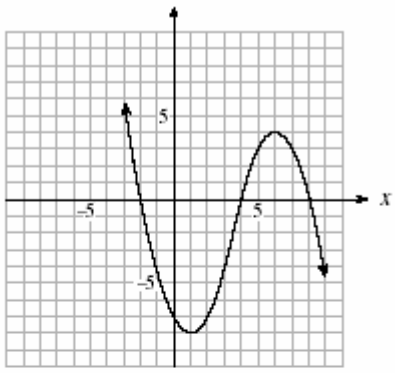


Which of the following graphs represents $y=-2f(x)$?

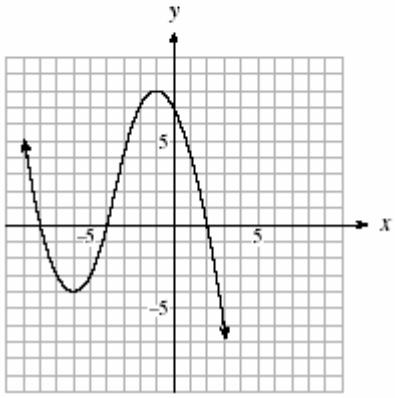
A.



B.



C.



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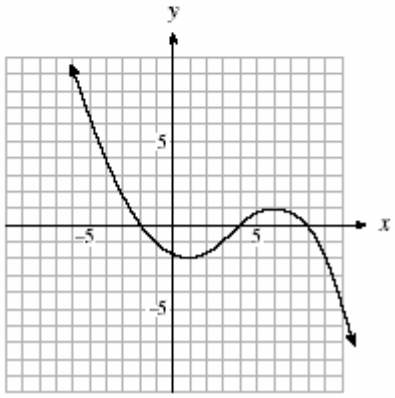
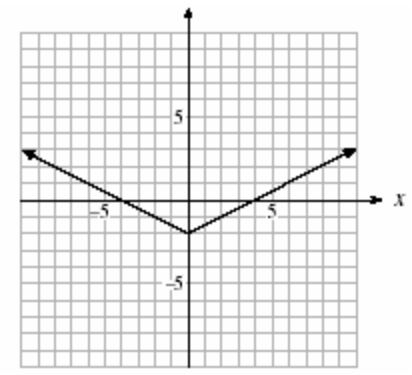
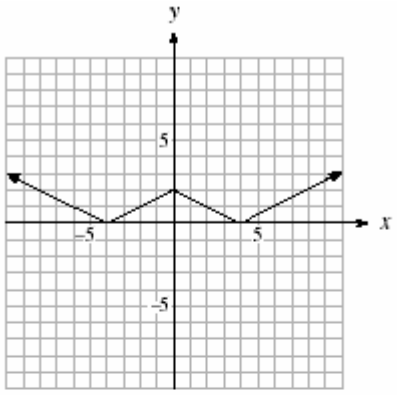


4. The graph of $y = f(x)$ is shown below.

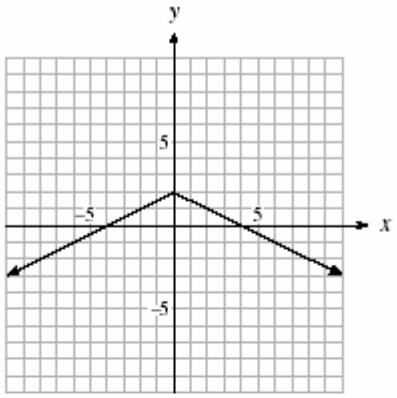


Which of the following graphs represents $y = \dfrac{1}{f(x)}$?

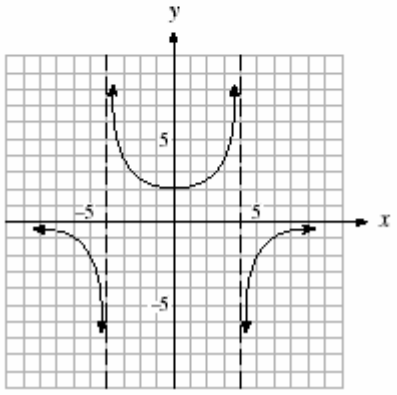
A.



B.



C.



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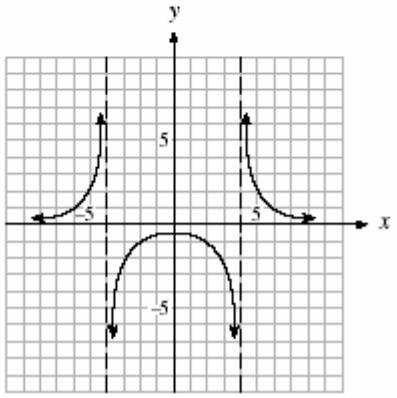


5. Which equation represents the graph of $y = x^3 + x^2$ after it is reflected in the y-axis?

A. $y = -x^3 + x^2$ B. $y = -x^3 - x^2$ C. $y = \dfrac{1}{x^3 + x^2}$ D. $x = y^3 + y^2$

6. Given the function $y = f(x)$, which of the following represents its reflection in the y-axis?

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

7. How is the graph of $y = \frac{1}{7} f(x)$ related to the graph of $y = f(x)$?

A. $y = f(x)$ has been compressed vertically by a factor of $\frac{1}{7}$.

B. $y = f(x)$ has been compressed horizontally by a factor of $\frac{1}{7}$.

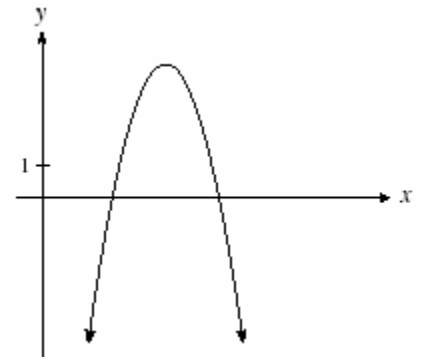
C. $y = f(x)$ has been expanded vertically by a factor of 7.

D. $y = f(x)$ has been expanded horizontally by a factor of 7.

8. Given $f(x) = x^3 - 27$, determine $f^{-1}(x)$, the inverse of $y = f(x)$.

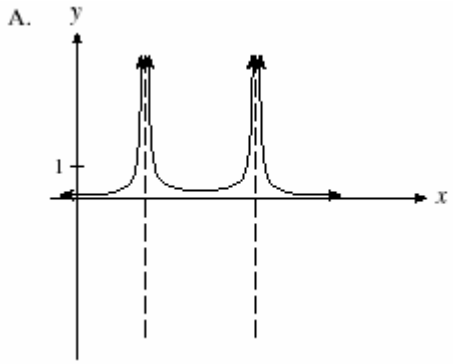
A. $f^{-1}(x) = \sqrt[3]{x+27}$ B. $f^{-1}(x) = \sqrt[3]{x-27}$ C. $f^{-1}(x) = \sqrt[3]{x}+3$ D. $f^{-1}(x) = x^3 + 27$

9. The graph of the function $y = f(x)$ is shown below.

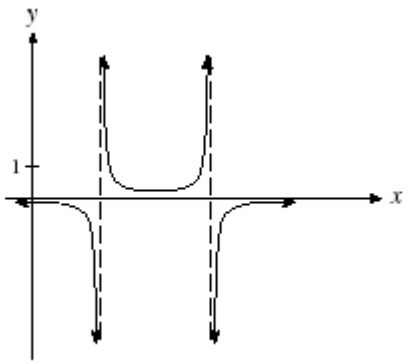


Which of the following is a graph of $y = \frac{1}{|f(x)|}$?

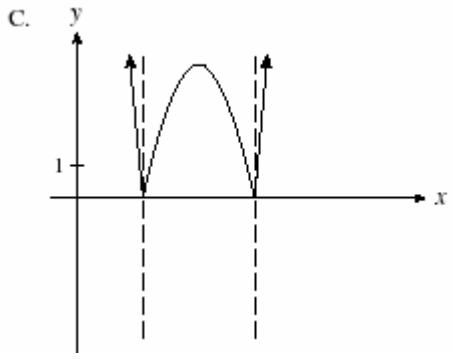
A.



B.



C.



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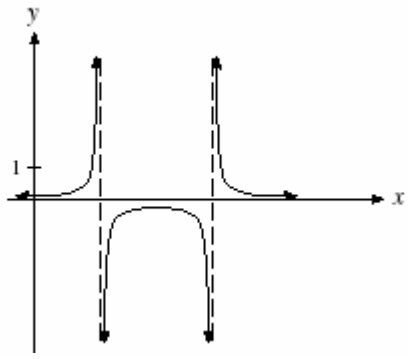
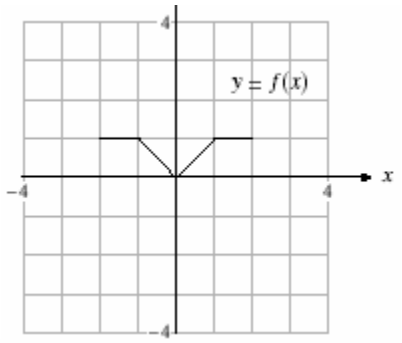


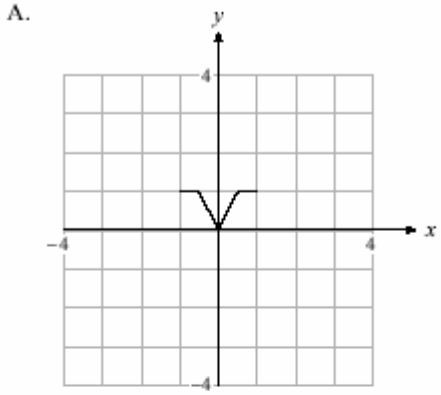
10. If (4, –3) is a point on the graph of $y = f(x)$, what point must be on the graph of $y = f(2x+10)$?

A. (–8, –3) B. (–3, –3) C. (3, –3) D. (18, –3)

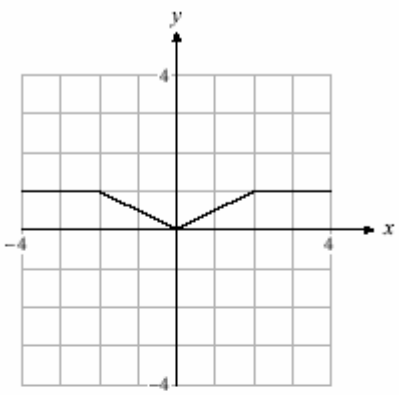
11. Given the graph of $y = f(x)$, select the graph of $y = \frac{1}{2} f(x)$.



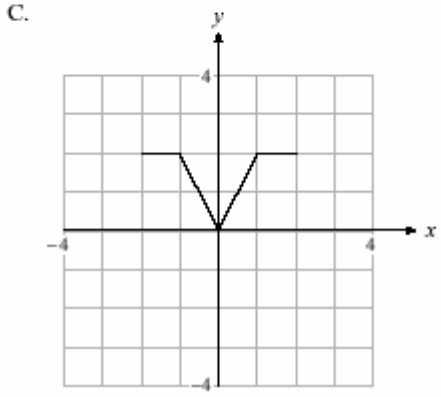
A.



B.



C.



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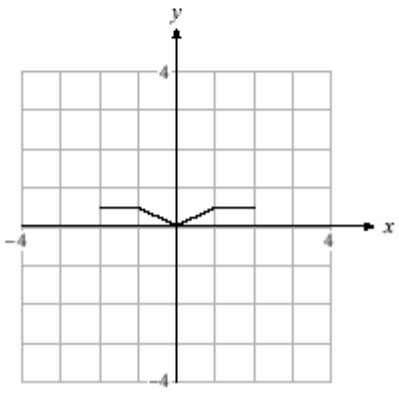
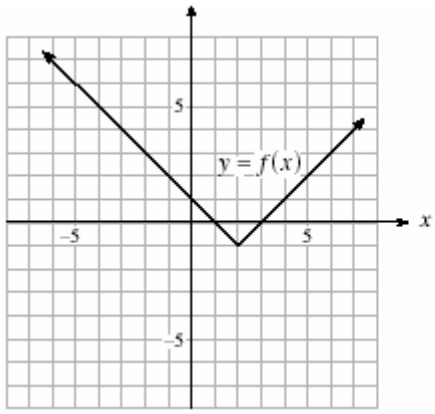
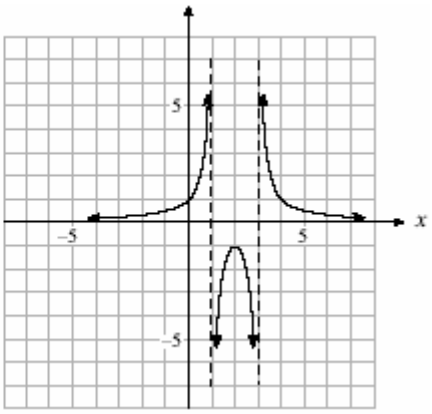


12. If (a, b) is a point on the graph of $y = f(x)$, determine a point on the graph of $y = f(x-2)+3$.

A. $(a-2, b+3)$ B. $(a-2, b+3)$ C. $(a+2, b+3)$ D. $(a+2, b-3)$

13. The graph of $y = f(x)$ is shown on the left. Determine the equation of the function shown on the right.

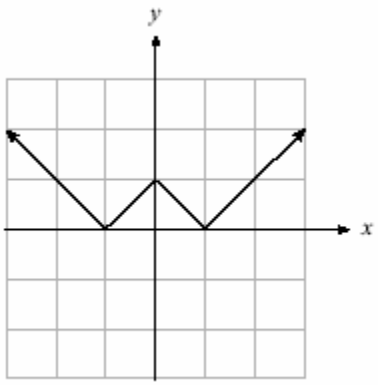




A. $y = |f(x)|$ B. $y = -f(x)$ C. $y = \dfrac{1}{f(x)}$ D. $y = f^{-1}(x)$

14. For which graph of $y = f(x)$ would $f(-x) = -f(x)$?

A.



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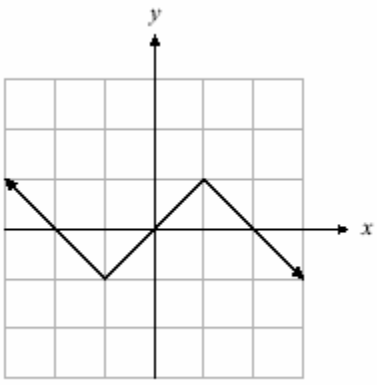
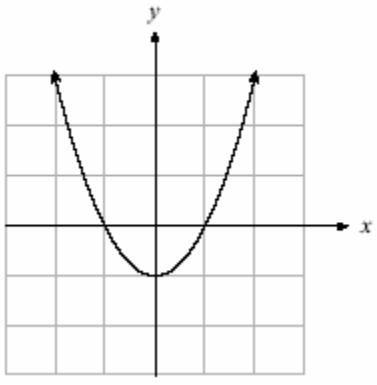


C.



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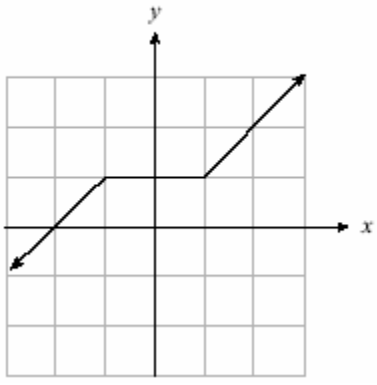
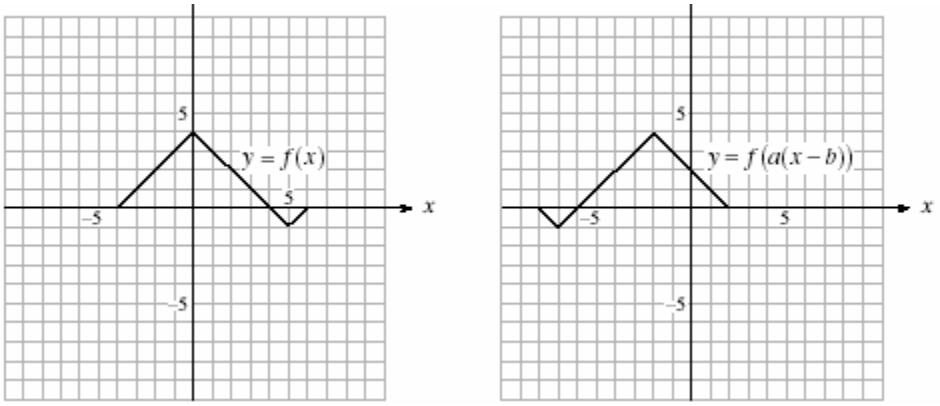


15. Two functions are graphed below, $y = f(x)$ and $y = f(a(x-b))$. Determine the values of *a* and *b*.



A. $a = -1, b = -2$ B. $a = -1, b = 2$ C. $a = 1, b = -2$ D. $a = 1, b = 2$

16. How is the graph of $y = \sqrt{x-3}+1$ related to the graph of $y = \sqrt{x}$?

A. $y = \sqrt{x}$ has been translated 3 units right and 1 unit up.
B. $y = \sqrt{x}$ has been translated 3 units right and 1 unit down.
C. $y = \sqrt{x}$ has been translated 3 units left and 1 unit up.
D. $y = \sqrt{x}$ has been translated 3 units left and 1 unit down.

17. Given $f(x) = 3x + 2$, determine $f^{-1}(x)$, the inverse of $f(x)$.

A. $f^{-1}(x) = \frac{x}{3} - 2$ B. $f^{-1}(x) = \frac{x-2}{3}$ C. $f^{-1}(x) = \frac{1}{3x+2}$ D. $f^{-1}(x) = 2 - \frac{x}{3}$

18. Which equation represents a reflection of the graph $5 - x = 2y^2 + y$ in the y-axis?

A. $5 + x = 2y^2 + y$ B. $5 - x = 2y^2 - y$
C. $5 + y = 2x^2 + x$ D. $-5 - x = 2y^2 + y$

19. If the point (–3, –6) is on the graph of $f(x)$, determine the point on the graph of $y = 3|f(x)| + 1$.

A. (3, 3) B. (3, 19) C. (–3, 3) D. (–3, 19)

20. Which equation represents the graph of $y = f(x)$ after it is compressed horizontally by a factor of $\frac{1}{2}$ and then translated 4 units to the right?

A. $y = f(2x - 8)$ B. $y = f(2x - 4)$ C. $y = f\left(\frac{x-4}{2}\right)$ D. $y = f\left(\frac{x}{2} - 4\right)$

21. How is the graph of $y = f(x) + 3$ related to the graph of $y = f(x)$?

A. $y = f(x)$ has been translated 3 units up.

B. $y = f(x)$ has been translated 3 units down.

C. $y = f(x)$ has been translated 3 units left.

D. $y = f(x)$ has been translated 3 units right.

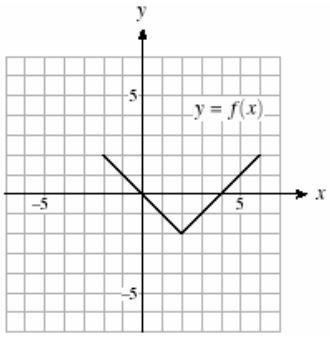
22. Which equation represents the graph of $y = f(x)$ after it is reflected in the line $y = x$?

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

23. If the graph of the function $y = \sqrt{x}$ is horizontally expanded by a factor of 3 and then translated 2 units to the right, determine the equation of this new function.

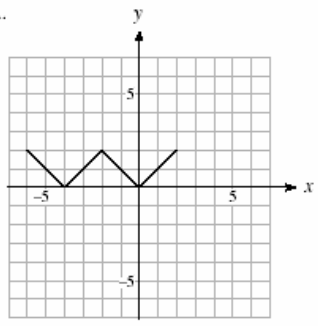
A. $y = \sqrt{3(x-2)}$ B. $y = \sqrt{\dfrac{1}{3}(x-2)}$ C. $y = \sqrt{3x-2}$ D. $y = \sqrt{\dfrac{1}{3}x-2}$

24. The graph of the function $y = f(x)$ is shown below.

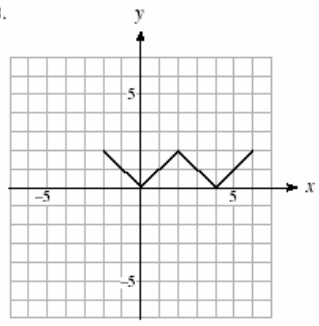


Which of the following is the graph of $y = |f(x)|$?

A.



B.



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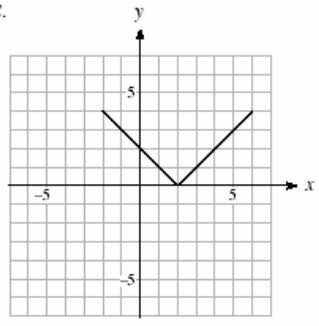

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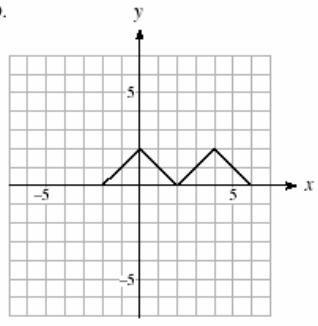
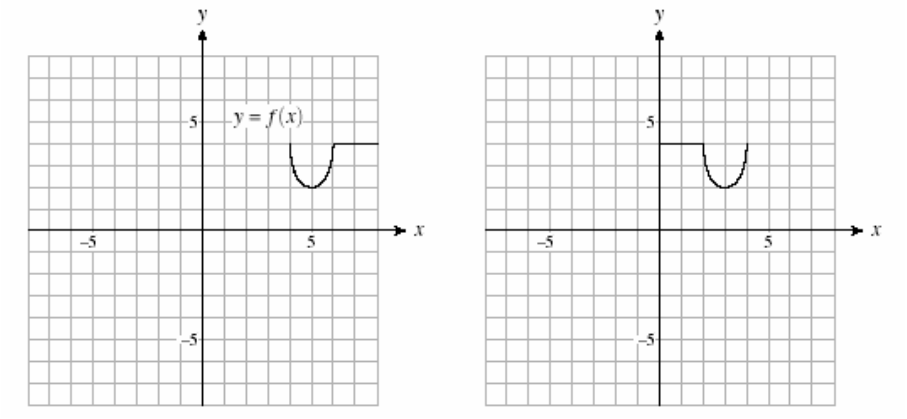


25. If (8, –6) is a point on the graph of $y = f(x)$, what must be a point on the graph of $y = -f(2x) + 3$?

A. (–16, –3) B. (–4, –3) C. (4, 9) D. (16, 9)

26. The graph of $y = f(x)$ is shown on the left. Which equation represents the graph shown on the right?



A. $y = f(-(x+8))$ B. $y = f(-(x-8))$ C. $y = -f(x-8)$ D. $y = -f(x+8)$

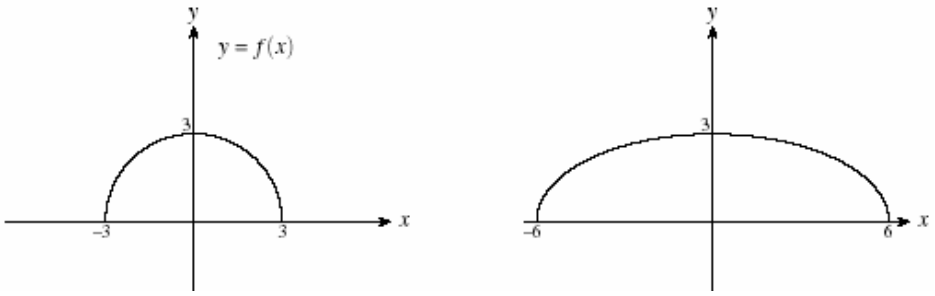
27. Which graph represents the graph of $y = f(x)$ after it is reflected in the x-axis?

A. $y = f(-x)$ B. $y = -f(x)$ C. $x = f(y)$ D. $y = |f(x)|$

28. If $f(x) = \dfrac{2x}{x-1}$, determine the equation of $f^{-1}(x)$, the inverse of $y = f(x)$.

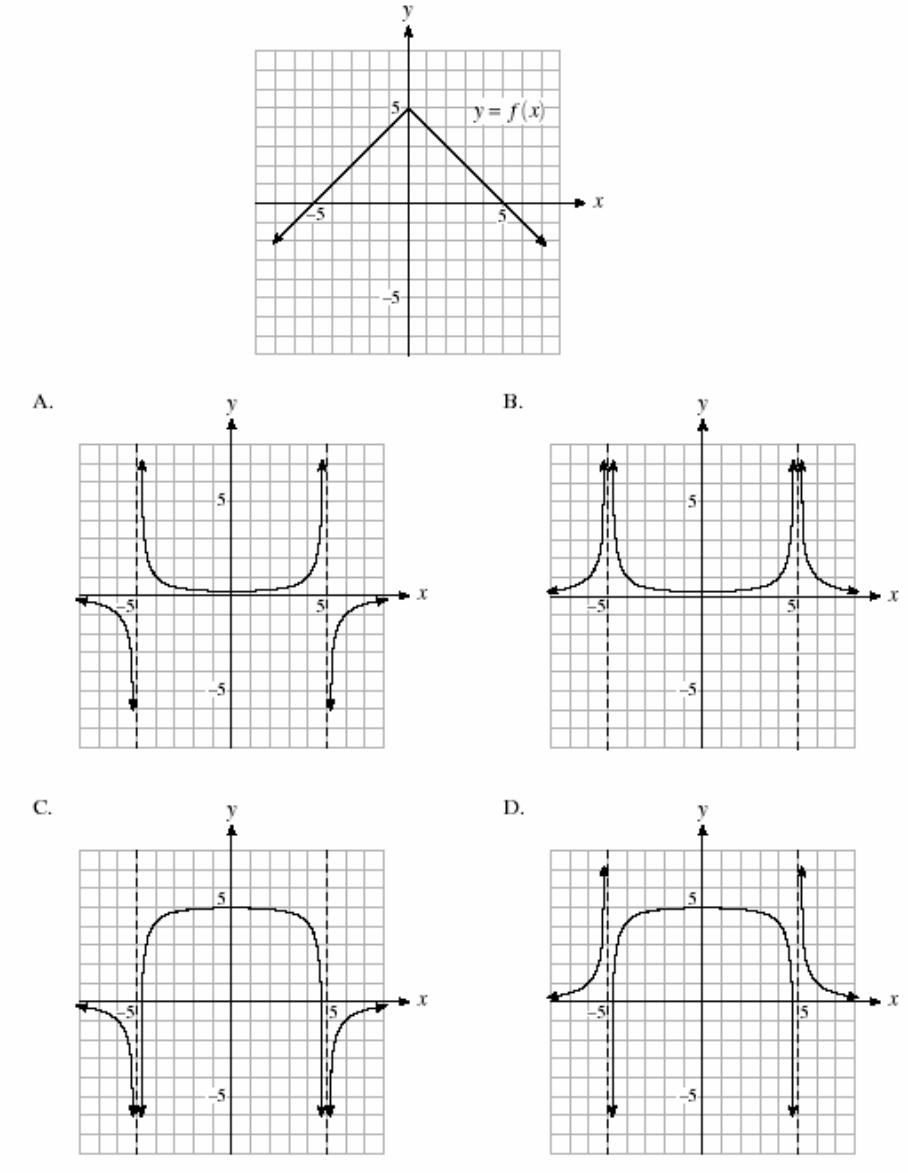
A. $f^{-1}(x) = \dfrac{x}{x-2}$ B. $f^{-1}(x) = \dfrac{2x}{2x-1}$ C. $f^{-1}(x) = \dfrac{x-1}{2x}$ D. $f^{-1}(x) = \dfrac{1}{x-2}$

29. The function $y = f(x)$ is graphed to the left. Determine the equation of the function shown to the right.



A. $y = f\left(\dfrac{1}{2}x\right)$ B. $y = f(2x)$ C. $y = \dfrac{1}{2}f(x)$ D. $y = 2f(x)$

30. Given the graph of $y = f(x)$, which of the following best represents the graph of its reciprocal function?



31. If the range of $y = f(x)$ is $-3 \le y \le 5$, what is the range of $y = |f(x)|$?

A. $-3 \le y \le 5$ B. $0 \le y \le 3$ C. $0 \le y \le 5$ D. $3 \le y \le 5$

32. The point (–2, 6) is on the graph of $y = f(x)$. Which of the following points must be on the graph of $y = \frac{1}{3} f\left(2(x-1)\right)$?

A. (0, 2) B. (–6, 2) C. (–3, 18) D. (–5, 18)

33. What is the inverse of $y=(x+1)^3$?

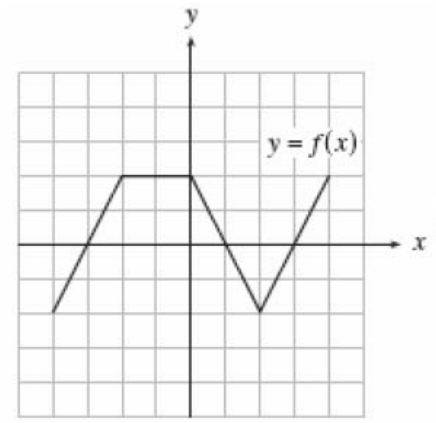
$A.\ y=\dfrac{1}{(x+1)^3}$ $B.\ y=-(x+1)^3$ $C.\ x=\sqrt[3]{y+1}$ $D.\ x=(y+1)^3$

34. If the zeros of the function $y=f(x)$ are -2 and 3, find the vertical asymptotes of $y=\dfrac{1}{f(x)}$

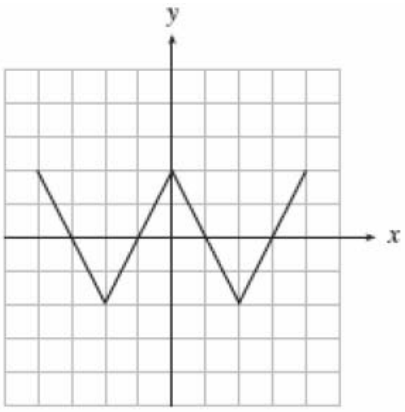
$A.\ x=-2, x=3$ $B.\ x=2, x=-3$ $C.\ y=-2, y=3$ $D.\ y=2, y=-3$

35. The graph of the function $y=f(x)$ is shown on the left.

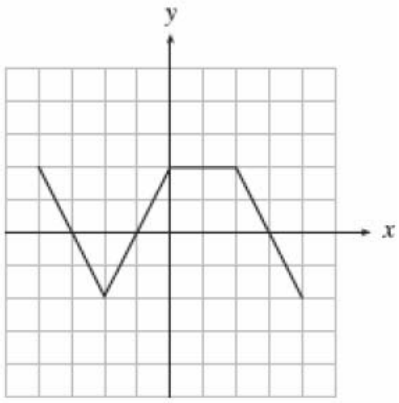
Which graph on the right represents $y=|f(x)|$



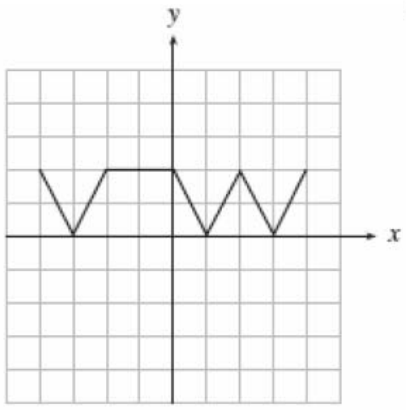
A.



B.



C.



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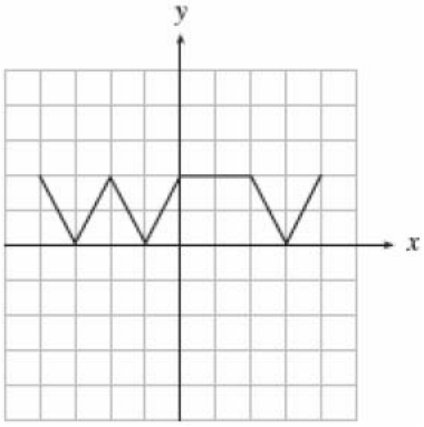


36. If the point $(6,-5)$ is on the graph $y=f(x)$, what point must be on $y=-f(2(x+2))-3$?

$A.(-1,2)$ $B.(1,-2)$ $C.(1,2)$ $D.(10,2)$

37. Given the function $y_1=f(x)$, describe how the function $y_2=4f(x-2)$ is related to y_1

A. The graph of y_1 has been vertically compressed by a factor of $\dfrac{1}{4}$ then translated 2 units to the right from the graph y_2

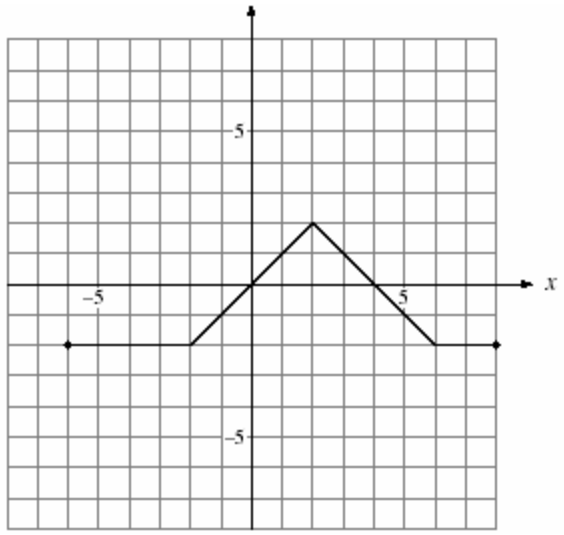
B. The graph of y_1 has been vertically compressed by a factor of 4 then translated 2 units to the right from the graph y_2

C. The graph of y_1 has been vertically compressed by a factor of $\dfrac{1}{4}$ then translated 2 units to the left from the graph y_2

D. The graph of y_1 has been vertically compressed by a factor of 4 then translated 2 units to the left from the graph y_2

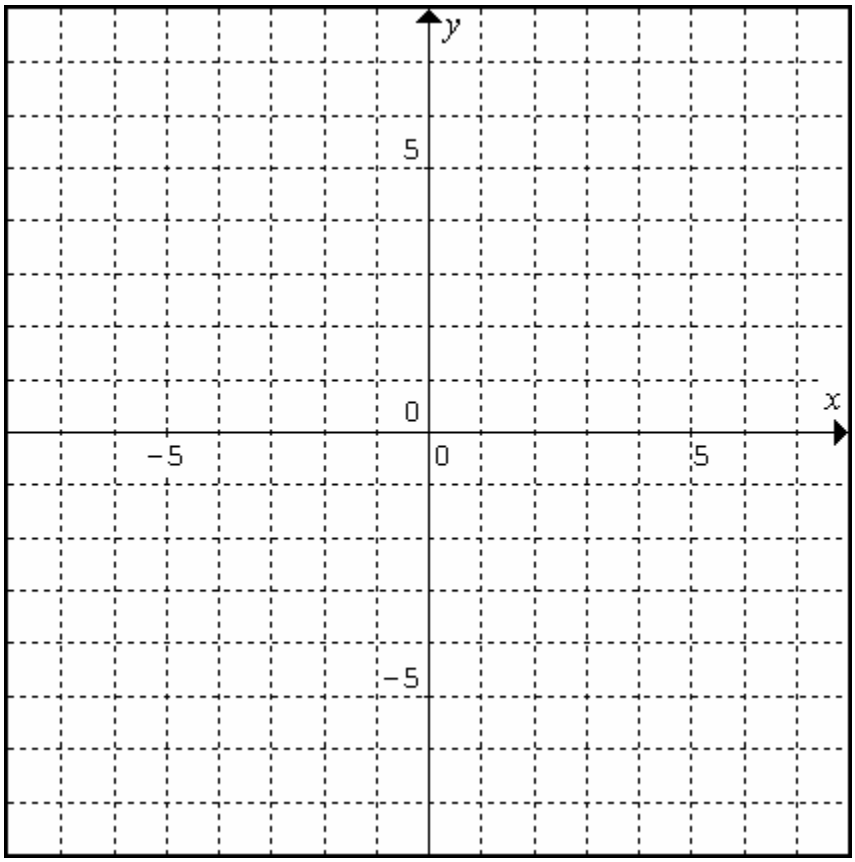
Written

1. The graph of $y = f(x)$ is shown below.

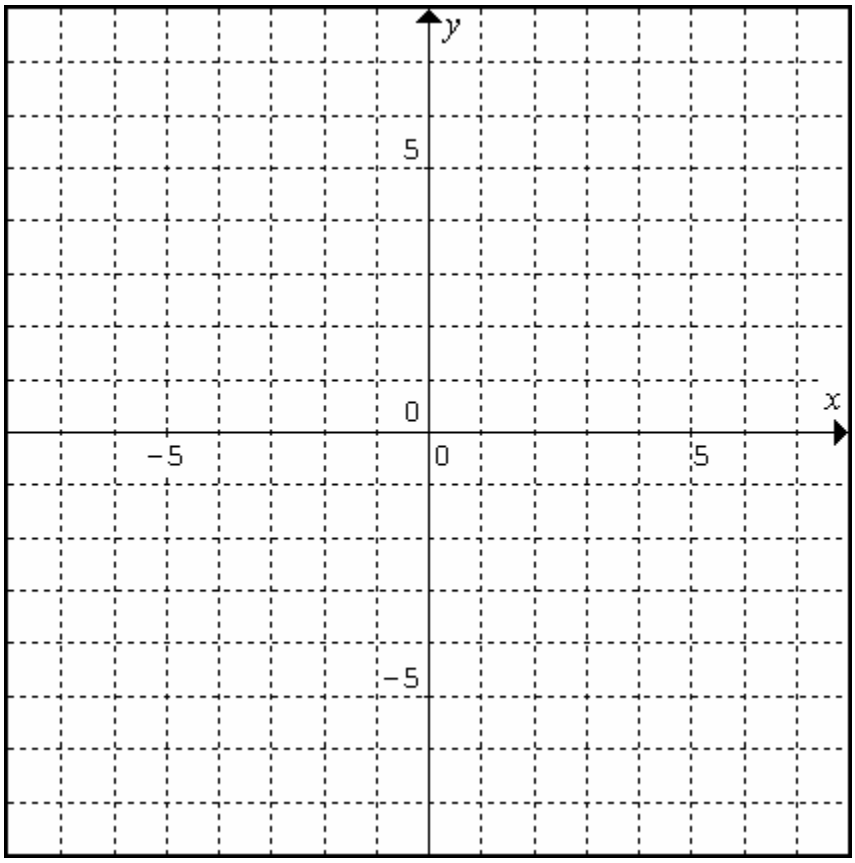


Sketch the graph of:

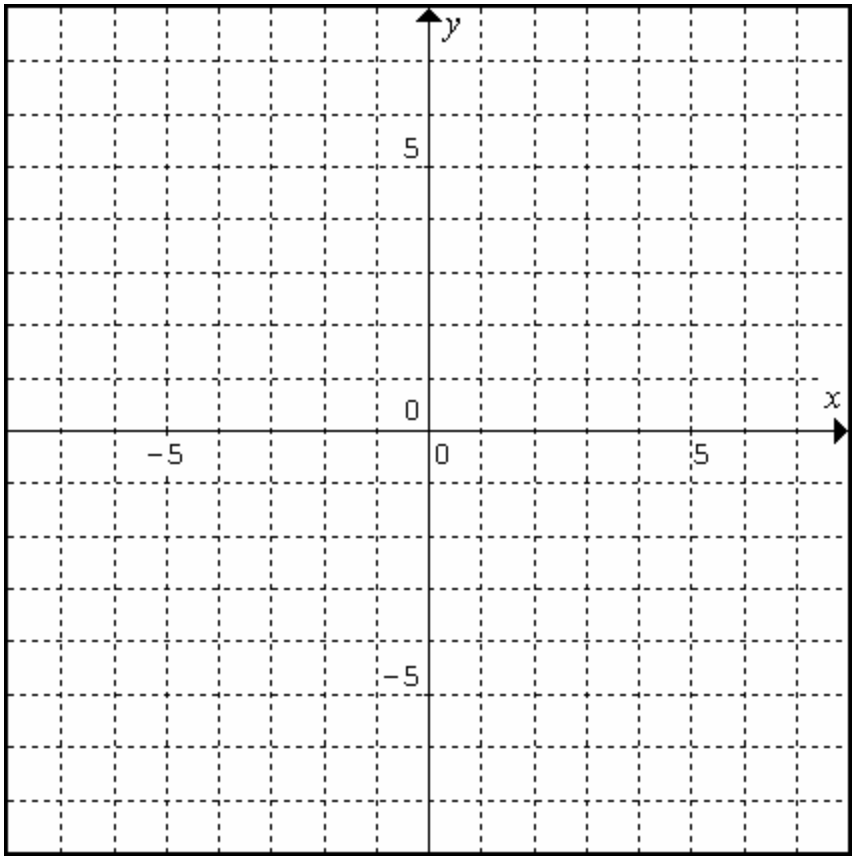
a) $y = f(x+2)-3$ (2 marks)



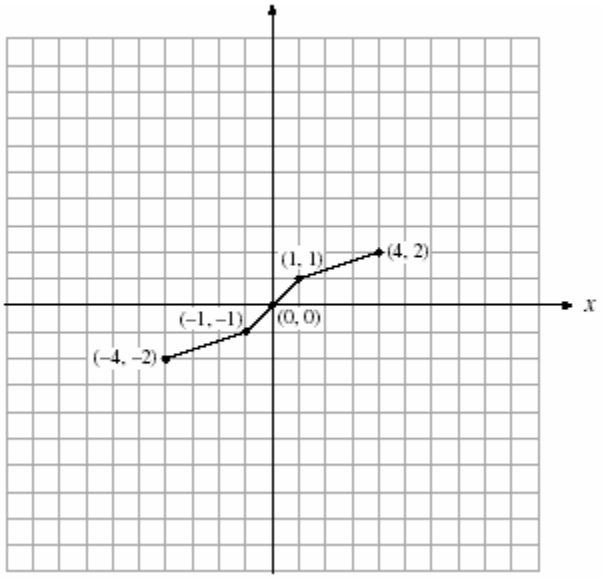
b) $y = f(2x)$ (2 marks)



c) $y = |f(2x)|$ (1 mark)



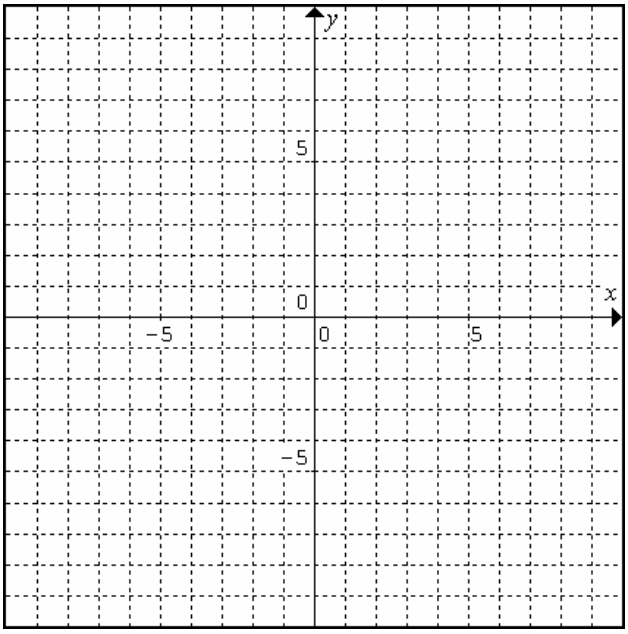
2. The graph of $y = f(x)$ is shown below.

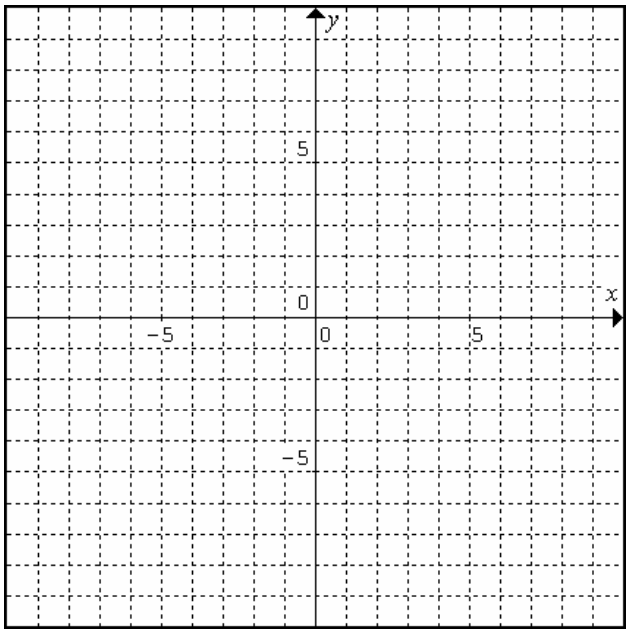


Sketch the graph of:

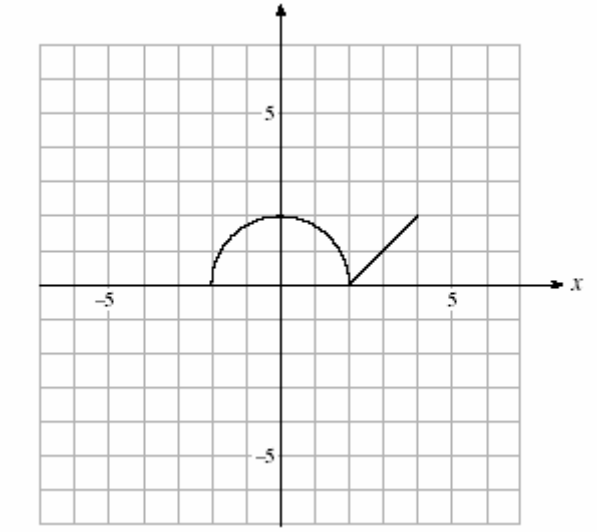
a) $y = 3f(x-2)$ (2 marks)

b) $y = -f\left(\frac{x}{2}\right)$ (3 marks)

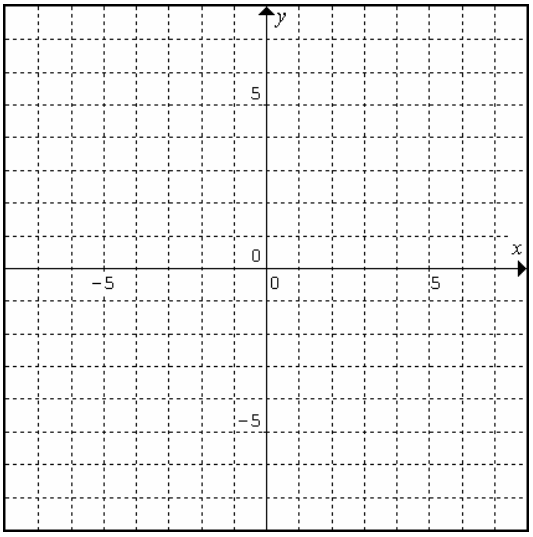




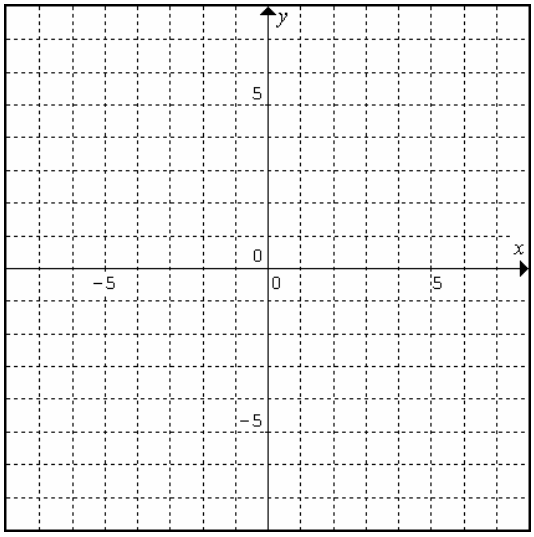
3. The graph of $y = f(x)$ is shown below.



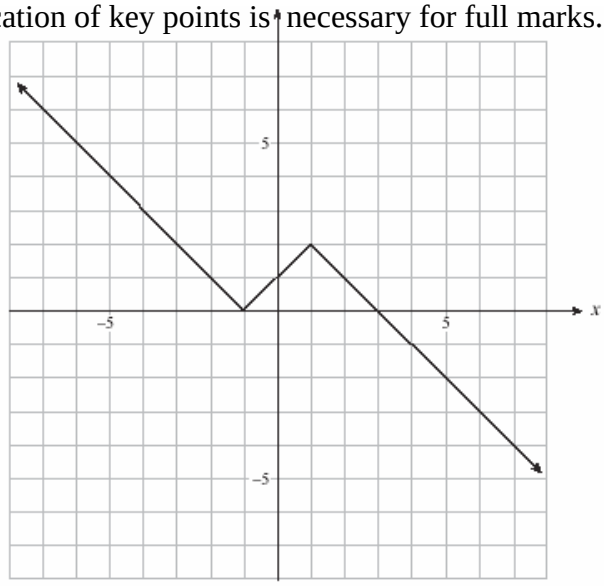
a) Graph $y = 2f(x+3)-1$



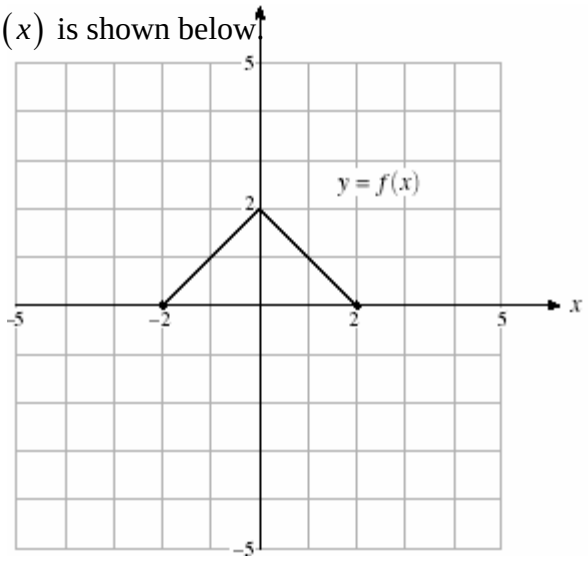
b) Graph the inverse of $y = f(x)$



4. The graph of $y = f(x)$ is shown below. Sketch the graph of $y = \dfrac{1}{f(x)}$ directly on the same grid. Accurate location of key points is necessary for full marks.

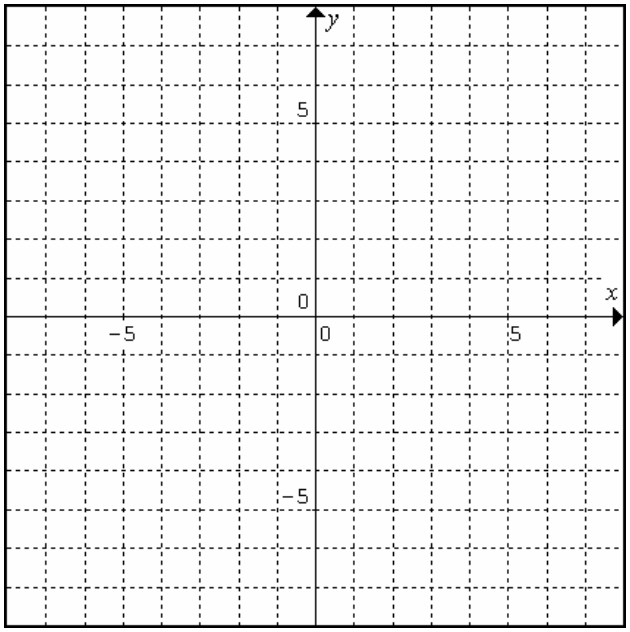


5. The graph of $y = f(x)$ is shown below.

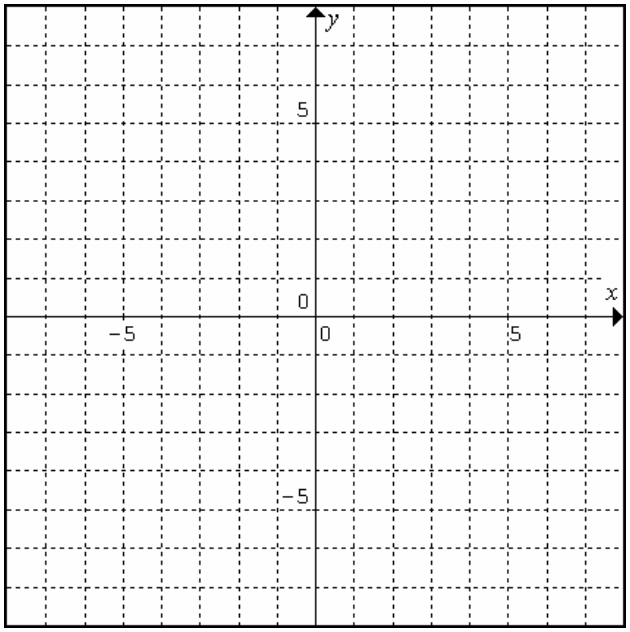


Sketch the graph of:

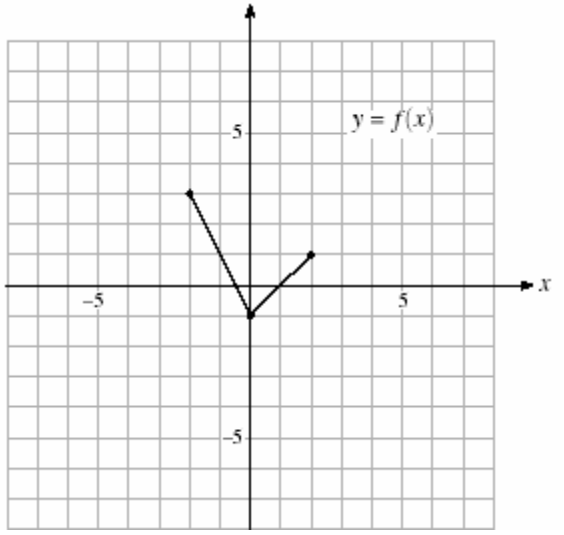
a) $y = 2f(x+3)$ (2 marks)



b) $y = \dfrac{1}{f(x)}$ (2 marks)

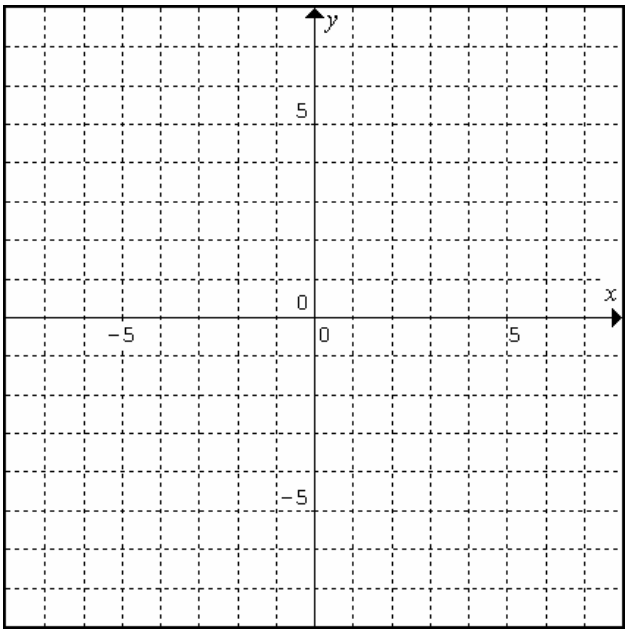


6. The graph of $y = f(x)$ is shown below.

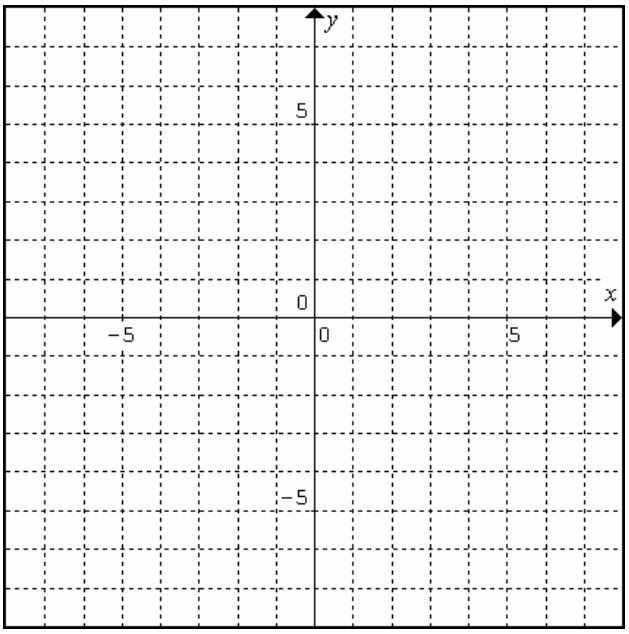


Sketch the graph of:

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

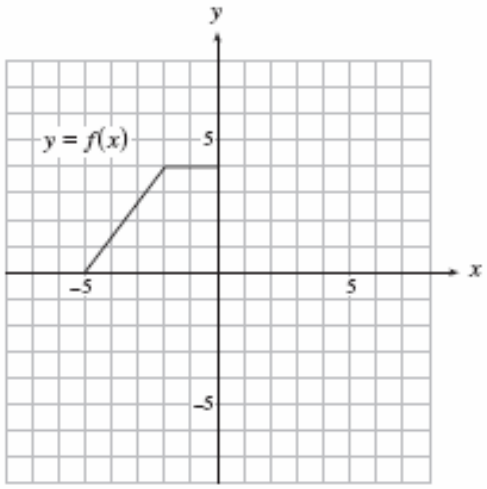


b) $y = 2f(-x)$ (2 marks)

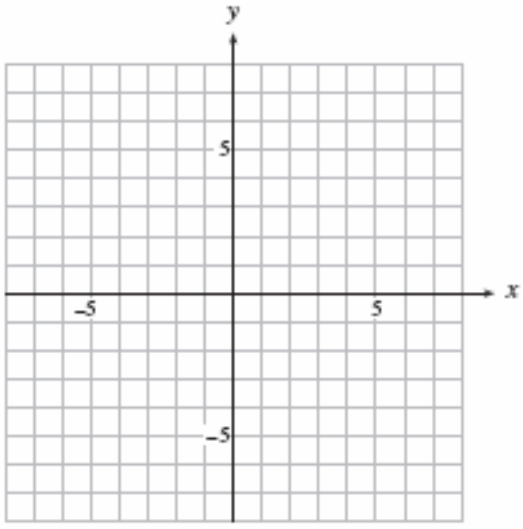


7.

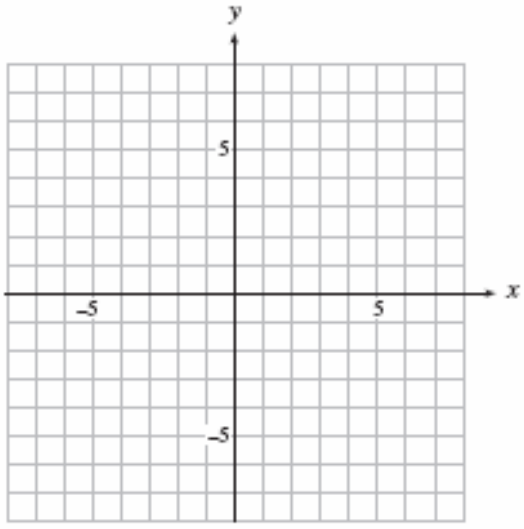
Given the graph of the function $y = f(x)$ below, sketch the graph of each relation on the grids provided.



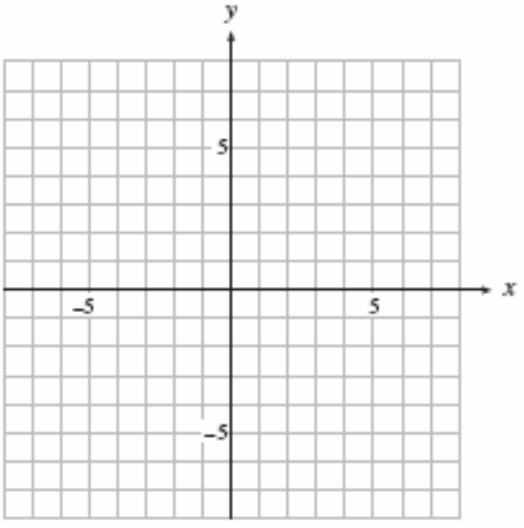
a) $y = f(-x)$ **(1 mark)**



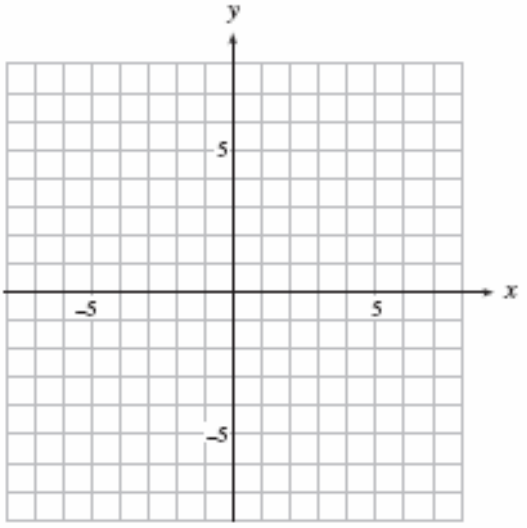
b) $y = f(x-3)$ **(1 mark)**



c) $y = 2f(x)$ **(1 mark)**



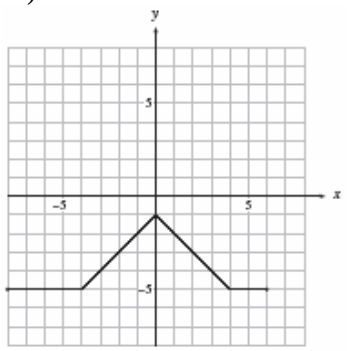
d) $x = f(y)$ **(2 marks)**



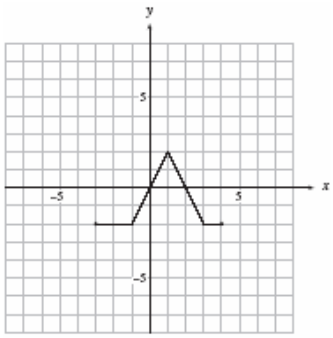
Key

1. B	2. C	3. B	4. D	5. A
6. A	7. A	8. A	9. A	10. B
11. D	12. C	13. C	14. B	15. A
16. A	17. B	18. A	19. D	20. A
21. A	22. A	23. B	24. B	25. C
26. B	27. B	28. A	29. A	30. A
31. C	32. A	33. D	34. A	35. C
36. C	37. B			

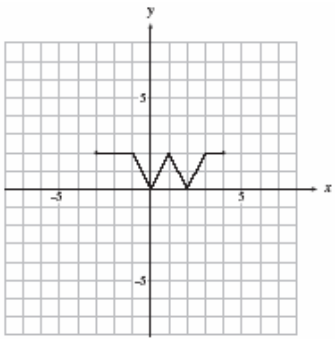
1a)



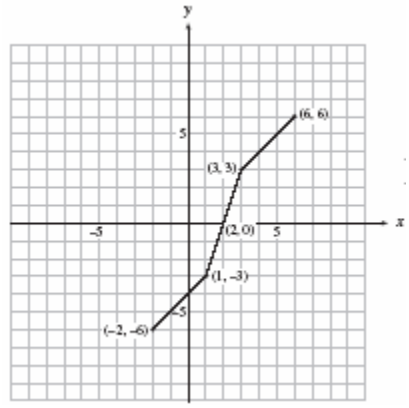
1b)



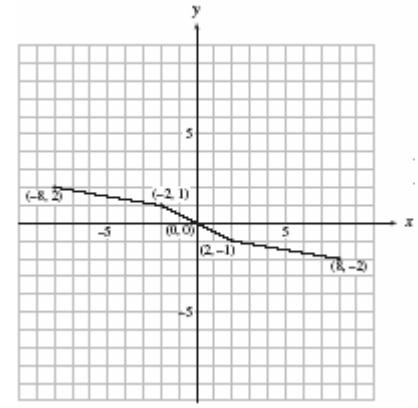
1c)



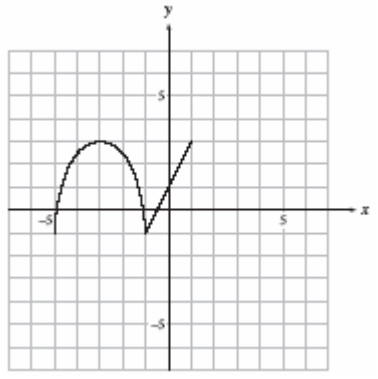
2a)



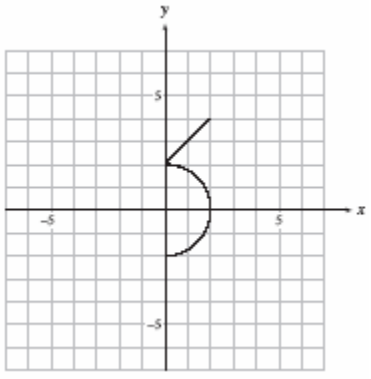
2b)



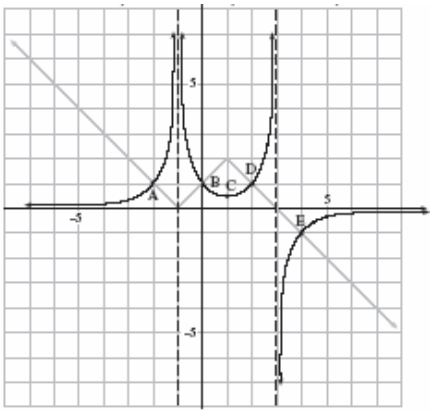
3a)



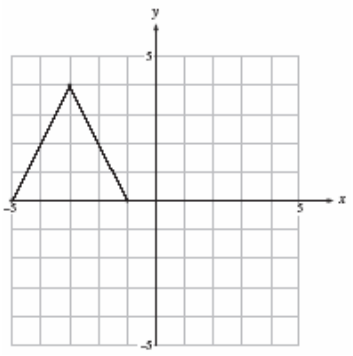
3b)



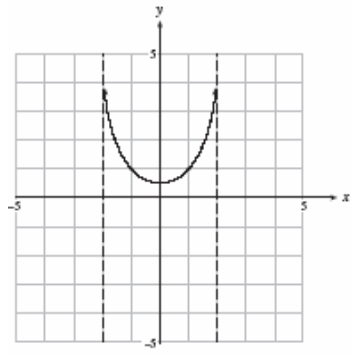
4)



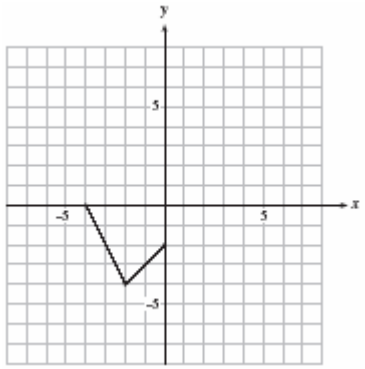
5a)



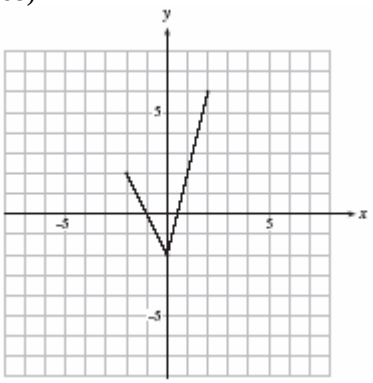
5b)



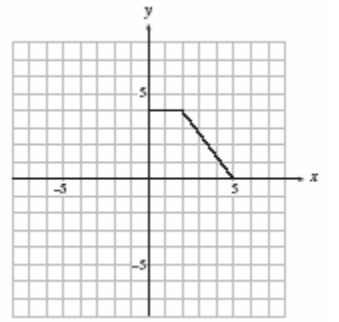
6a)



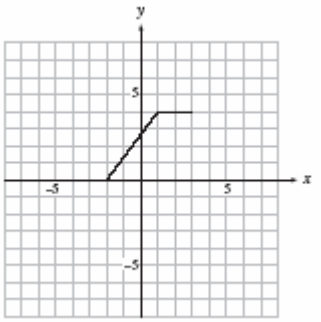
6b)



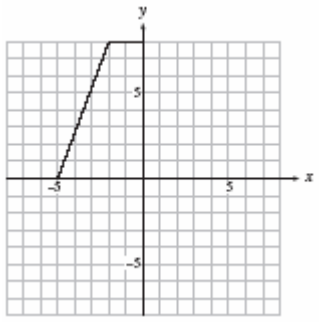
7a)



7b)



7c)



7d)