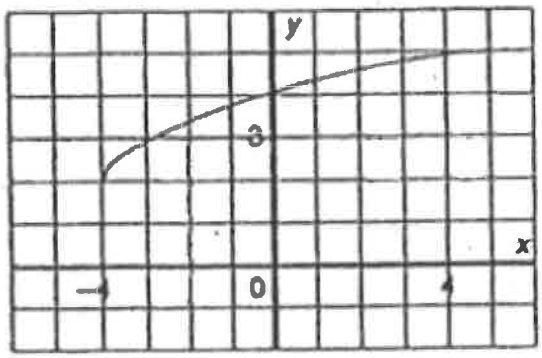
KEY

Unit 1 – Functions and Transformations REVIEW

1. The graph of $y = (x+3)^2$ is the image of the graph of $y = x^2$ after a translation of 3 units. In which direction is this translation?

a. up b. down c. right d. left

2. Which equation corresponds to this graph? HINT: sketch $y = \sqrt{x}$ first!



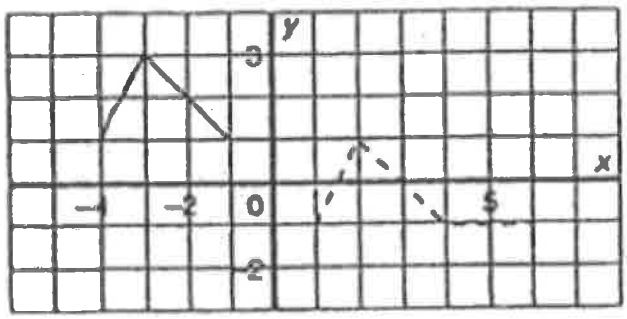
a. $y = \sqrt{x+4}+2$

b. $y = \sqrt{x+2}+4$

c. $y = \sqrt{x-4}+2$

d. $y = \sqrt{x-2}+4$

3. The function, $y = f(x)$, is defined in the graph below as the SOLID line. Which of the following represents the equation of the function defined by the dashed line?



a. $y = f(x+2)$

b. $y = f(x-5)-2$

c. $y = f(x-2)-5$

d. $y = f(x+5)+2$

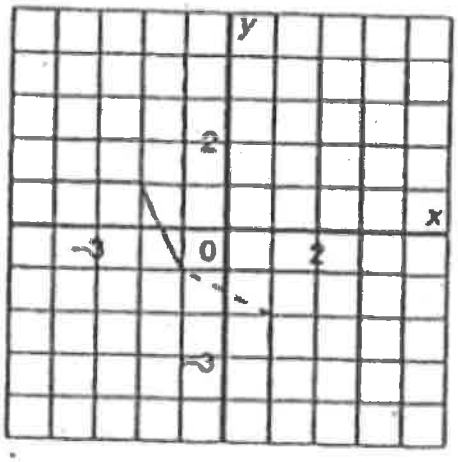
4. Which equation represents the function $y = \frac{1}{x-3}$ after a reflection over the y-axis?

a. $y = \frac{1}{3-x}$ b. $y = x-3$ c. $y = \frac{1}{-x-3}$ d. $x = \frac{1}{y-3}$

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

6. The function, $y = f(x)$, is defined in the graph below as the SOLID line. Which of the following represents the equation of the function defined by the dashed line?



a. $y = -f(x)$

b. $y = f(-x)$

c. $y = -f(-x)$

d. $x = f(y)$

7. How is the graph of $2y = \sqrt{x}$ related to the graph of $y = \sqrt{x}$?

a. $y = \sqrt{x}$ has been expanded vertically by a factor of 2

b. $y = \sqrt{x}$ has been compressed vertically by a factor of $\frac{1}{2}$

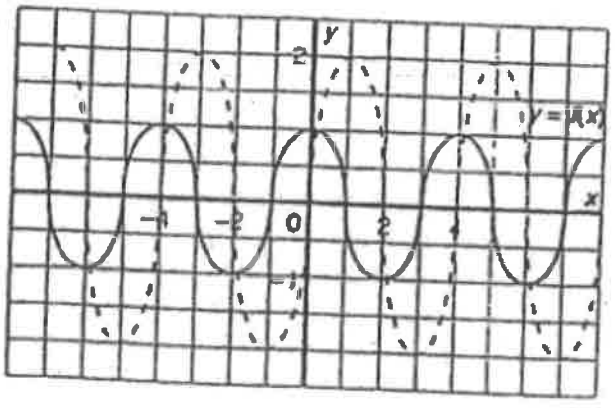
c. $y = \sqrt{x}$ has been expanded horizontally by a factor of 2

d. $y = \sqrt{x}$ has been compressed horizontally by a factor of $\frac{1}{2}$

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

a. $(0, 2)$ b. $(-6, 2)$ c. $(-3, 18)$ d. $(-5, 18)$

9. The function, $y = f(x)$, is defined in the graph below as the SOLID line. Which of the following represents the equation of the function defined by the dashed line?



a. $y = f(2x - 1)$

b. $y = f(2x) - 1$

c. $y = 2f(x) - 1$

d. $y = 2f(x - 1)$

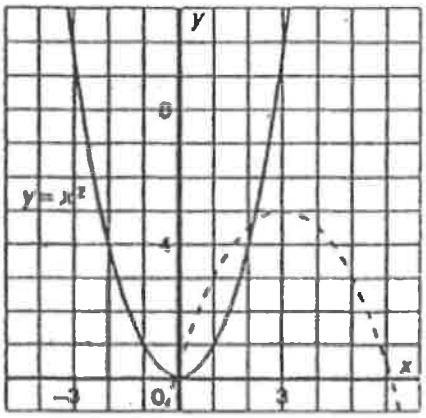
10. With respect to question 9, which is *another* equation of the function defined by the dashed line?

a. $y = f(2x + 3)$ b. $y = f(2x) + 3$ c. $y = 2f(x) + 3$ d. $y = 2f(x + 3)$

11. A function is defined by $y = \sqrt{x}$. The function is reflected over the y-axis, translated 3 units left, then compressed horizontally by a factor of $\frac{1}{2}$. Which is the equation of its image?

a. $y = \sqrt{-2x + 3}$ b. $y = \sqrt{-2(x + 3)}$ c. $y = -\sqrt{2x + 3}$ d. $y = -2\sqrt{x + 3}$

12. The function, $y = x^2$, is defined in the graph below as the SOLID line. Which of the following represents the equation of the function defined by the dashed line?



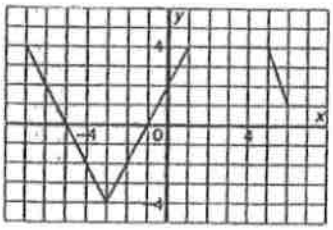
a. $y = -2(x - 3)^2 + 5$

b. $y = -\frac{1}{2}(x - 3)^2 + 5$

c. $y = \frac{1}{2}(x + 3)^2 - 5$

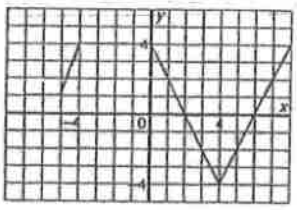
d. $y = \frac{1}{2}(3 - x^2) + 5$

13. The function, $y = f(x)$, is defined in the diagram below:

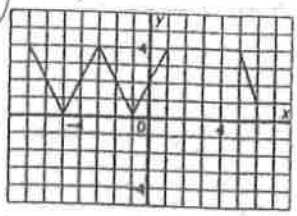


Which diagram defines the function, $y = |f(x)|$?

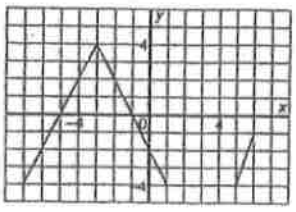
A.



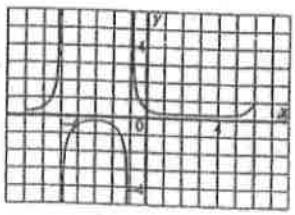
B.



C.

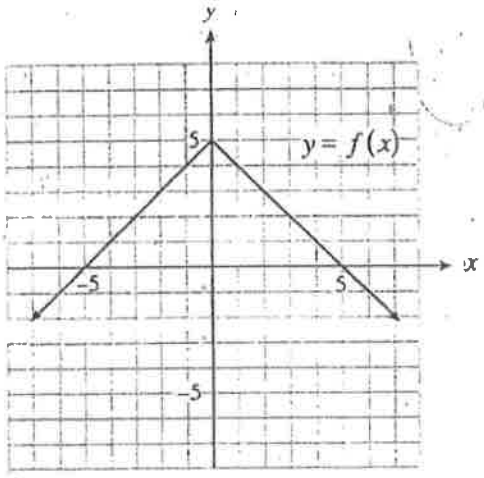


D.

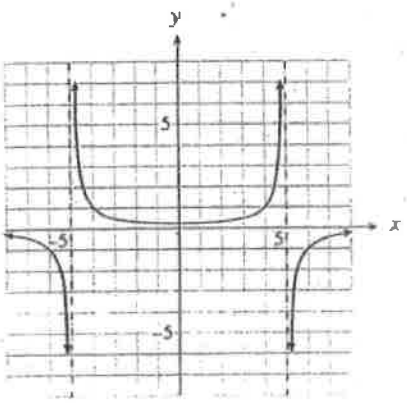


14. Using the graph of $y = f(x)$ in question 13, which of the answer options provided in question 13 represents the function $y = \frac{1}{f(x)}$? d

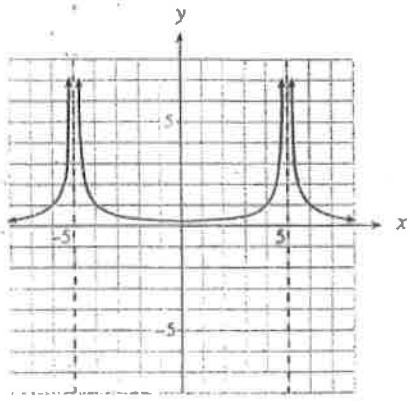
15. Given the graph of $y = f(x)$, which of the following best represents the graph of $y = \frac{1}{f(x)}$?



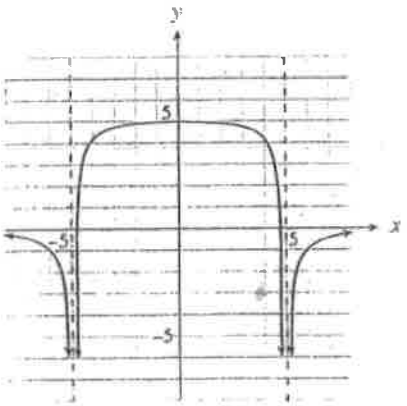
A.



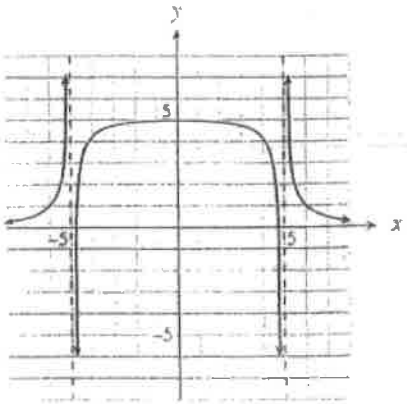
B.



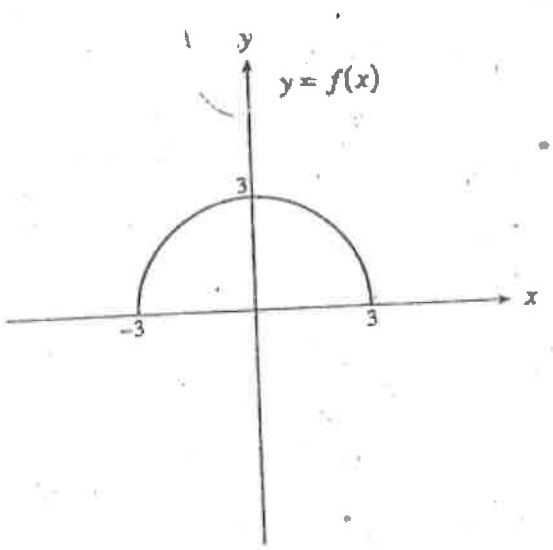
C.

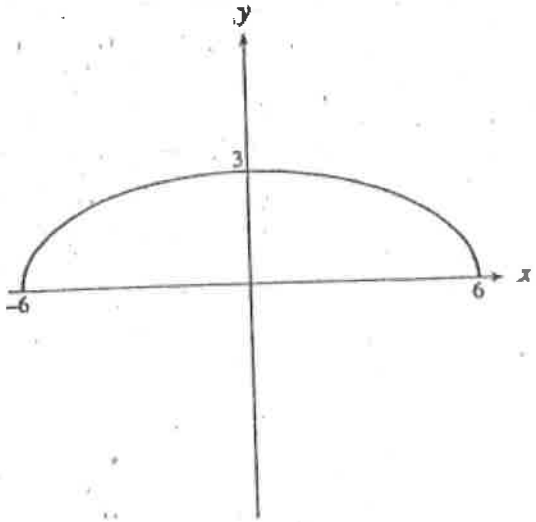


D.



16. The function, $y = f(x)$ is graphed below left. Determine the equation of the function represented below right.



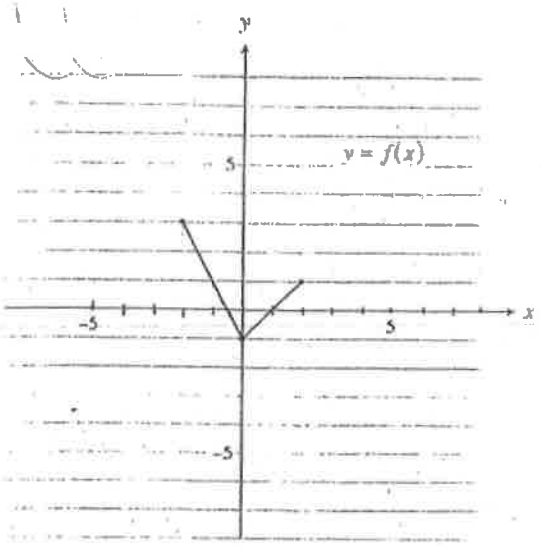


a. $y = f\left(\frac{1}{2}x\right)$ b. $y = f(2x)$ c. $y = \frac{1}{2}f(x)$ d. $y = 2f(x)$

17. If $f(x) = \frac{2x}{x-1}$, determine the equation of $f^{-1}(x)$.

a. $f^{-1}(x) = \frac{x}{x-2}$ b. $f^{-1}(x) = \frac{2x}{2x-1}$ c. $f^{-1}(x) = \frac{x-1}{2x}$ d. $f^{-1}(x) = \frac{1}{x-2}$

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

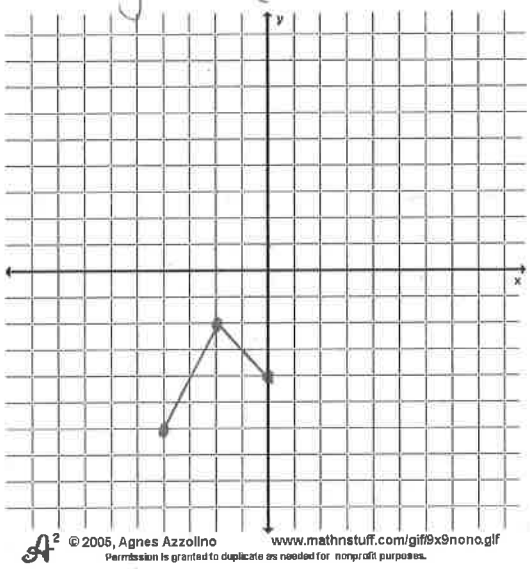


On the grids provided, sketch the graphs of:

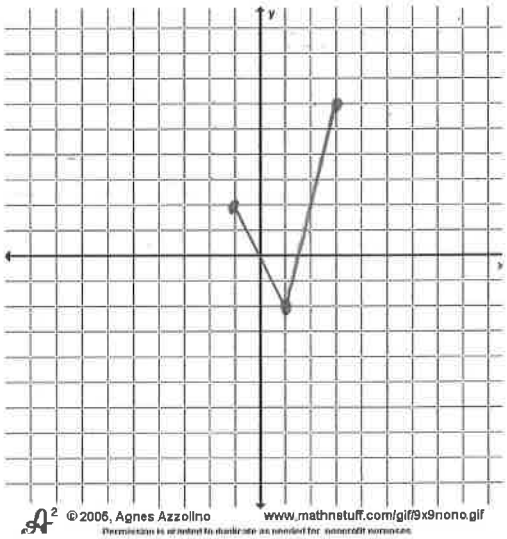
a) $y = -f\left(\frac{2x+4}{2}\right) - 3$; b) $y = 2f(-x+1)$; c) $y = -\frac{1}{2}f^{-1}(x-3) - 1$

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

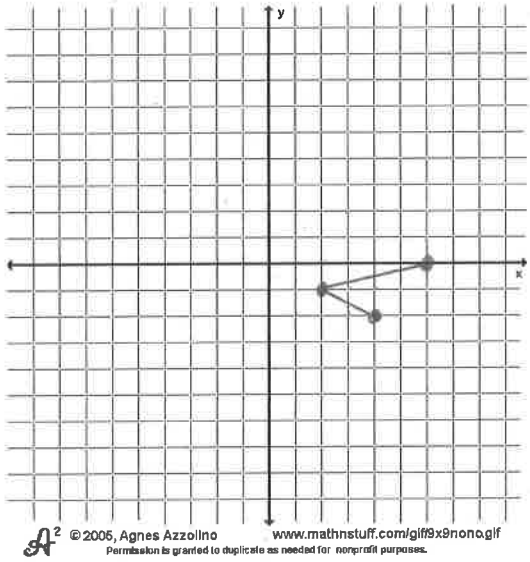
$y = -f(x+2) - 3$



b) $y = 2f(-1(x-1))$



c)



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