NAME _____ DATE _____

Module Test B

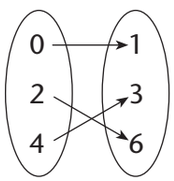
Module 9

1. Find the domain and range of the relation. $T = \{(4, -5), (3, 6), (2, 4), (-4, 9), (2, 1)\}$

Domain = {–4, 2, 3, 4}; Range = {–5, 1, 4, 6, 9}

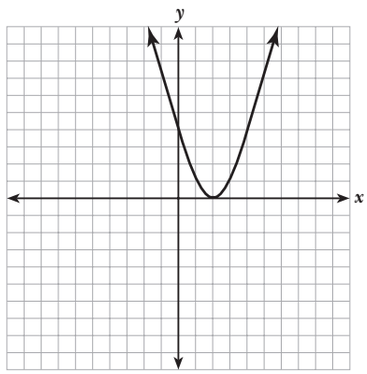
Is the relation a function? Yes or No.

2.



yes

3.



yes

4. Find the domain and range of the relation given by the equation $x = y - 3$.

Domain = ℜ; Range = ℜ

5. The relation given by the equation $y = 2x + 2$ has a domain of {–4, 0, 4}. Find its range.

Range = {–6, 2, 10}

Use the set of ordered pairs {(2, 1), (–5, 3), (6, 2), (3, 4)} for questions 6 and 7.

6. What output is associated with and input of 3?

4

7. What input is associated with an output of 2?

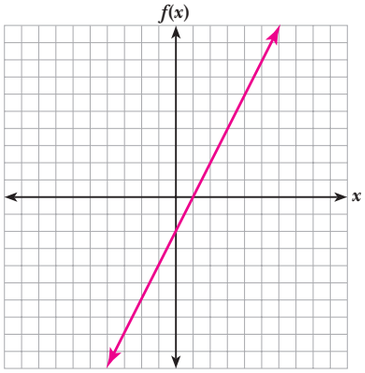
6

8. Evaluate $f(1)$ if $f(x) = x^2 + x + 4$. **6**

9. Evaluate $g(3)$ if $g(x) = \sqrt{x + 1} - x$. **–1**

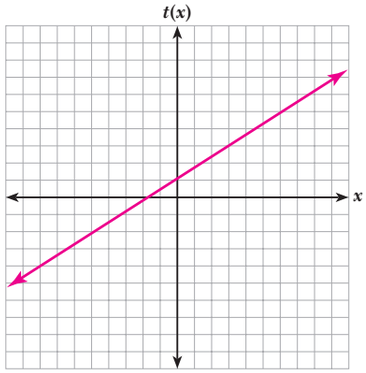
10. Evaluate $h(-1)$ if $h(x) = \frac{9x}{x + 4}$. **–3**

11. Use the graph of $f(x)$ to find $f(0)$.



–2

12. Use the graph of $t(x)$ to find $t(3)$.



3

Write a function for the pattern shown in each table.

13.

x	f(x)
0	2
1	3
2	4
3	5

$f(x) = x + 2$

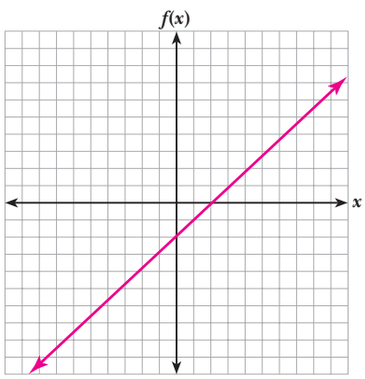
14.

x	g(x)
–1	–2
1	2
3	6
5	10

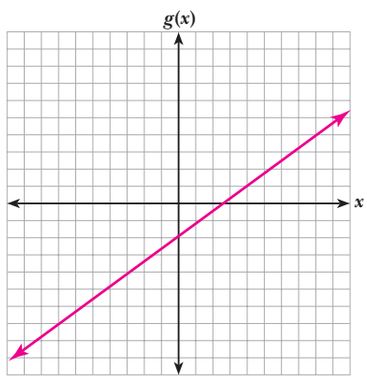
$g(x) = 2x$

Graph each function.

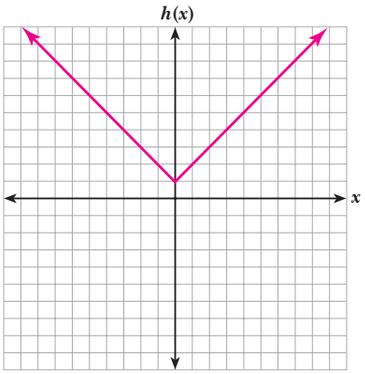
15. $f(x) = x - 2$



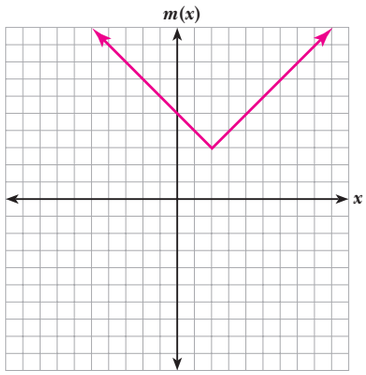
16. $g(x) = \frac{3}{4}x - 2$



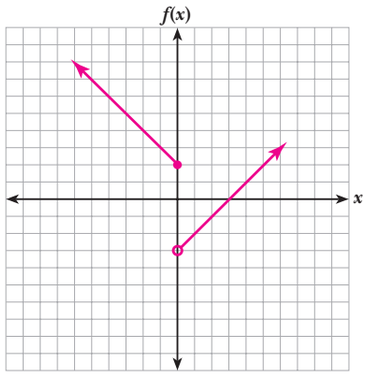
17. $h(x) = |x| + 1$



18. $m(x) = |x - 2| + 3$



19. Graph. $f(x) = \begin{cases} x - 3, & x > 0 \\ -x + 2, & x \leq 0 \end{cases}$



20. Evaluate $f(g(-4))$ if $f(x) = x - 1$ and $g(x) = x^2 - 3$. **12**

21. Evaluate $g(f(-1))$ if $f(x) = 2x^2$ and $g(x) = -\frac{2}{x}$. **–1**

22. Find $(f \circ g)(x)$ if $f(x) = x^2 - 3$ and $g(x) = -2x$. **$4x^2 - 3$**

23. Find $g(f(x))$ if $f(x) = 2x$ and $g(x) = 4x^2 - 1$. **$16x^2 - 1$**

24. The charge for a one-hour rental is $25. The charge for a two-hour rental is $45. The rental charge is a linear function. Write the equation for this function and use this function to find the cost of a 3 hour rental.

$f(x) = 20x + 5$; $65

25. Which of the following is **not** a function?

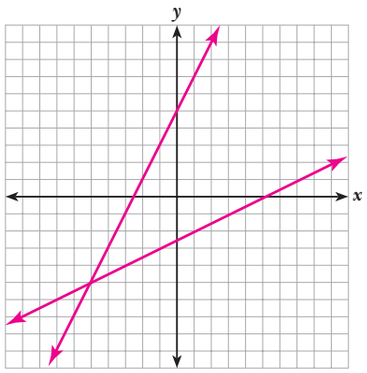
A. $x = 3$ **B.** $y = |x|$
C. $y = x^2$ **D.** $y = (x + 2)^2$

26. Find $f(-1)$ if $f(x) = x^2 + 3x + 5$.

A. 9 **B.** 1 **C.** 3 **D.** 7

27. Answer the following questions in the space provided. Show all work. Be sure to label your responses (A), (B), and (C).

A. Graph $f(x)$ and $g(x)$ if $f(x) = 2x + 5$ and $g(x) = \frac{x - 5}{2}$.



B. Find $f(g(x))$ and $(g(f(x))$.

$(f \circ g)(x) = 2\left(\frac{x - 5}{2}\right) + 5 = x - 5 + 5 = x$

$(g \circ f)(x) = \frac{2x + 5 - 5}{2} = \frac{2x}{2} = x$

C. Are $f(x)$ and $g(x)$ inverses? Explain.

Yes, $f(x)$ and $g(x)$ are inverses. Two functions are inverses if $f(g(x)) = g(f(x)) = x$.