Answer Key: page 4

Introduction to Functions and Relations

Determine if the following is a function or relation.

1. $\{(1,2),\ (4,6),\ (-9,0),\ (7,-3)\}$
2. $\{(3,8),\ (1,9),\ (-2,-14),\ (3,5)\}$
3. $\{(7,4),\ (8,\ 3),\ (0,0),\ (2,-3),\ (4,1),\ (15,2)\}$
4. $\{(10,5),\ (4,\ 2),\ (1,-12),\ (1,-5),\ (0,10),(1,\ 1)\}$
5. $\{(0,-9),\ (-3,7),\ (2,\ 8),\ (-6,-3),\ (-5,\ 2),\ (1,-9)\}$
6. $\{(8,2),\ (4,-6),\ (-9,3),\ (3,-9),\ (8,-6)\}$

Evaluate the function for the given value.

7. $f(x) = x + 10,\ \ x = -10$
8. $f(x) = -3x - 5,\ \ x = -6$
9. $f(x) = 4x + (8 - x),\ \ x = -5$
10. $f(x) = \frac{3x+4}{x},\ \ x = 2$
11. $f(x) = 10(x^2 + x)\ \ x = -4$

Find the domain of the function

12. $\{(1,2),\ (4,6),\ (-9,0),\ (7,-3)\}$
13. $\{(7,4),\ (8,\ 3),\ (0,0),\ (2,-3),\ (4,1),\ (15,2)\}$
14. $\{(0,-9),\ (-3,7),\ (2,\ 8),\ (-6,-3),\ (-5,\ 2),\ (1,-9)\}$

Function Operations

15. $Given\ f(x) = 2x - 4\ and\ g(x) = 3x + 1\ find\ f(x) + g(x)$
16. $Given\ g(x) = 2x\ and\ f(x) = x - 1\ find\ f(x)g(x)$
17. $Given\ f(x) = 6\ and\ g(x) = 2x^2 - 1\ find\ f(x) - g(x)$
18. $Given\ f(x) = x - 2\ and\ g(x) = 6 - 2x$
    $find\ h(-2) where\ h(x) = f(x) + g(x)$

Inverse Functions

Find the inverse of the function

19. $f(x) = 5x$
20. $g(x) = 5x - 1$
21. $h(x) = 7x + 10$
22. $f(x) = \frac{x+5}{4}$
23. $g(x) = \frac{x+9}{2}$

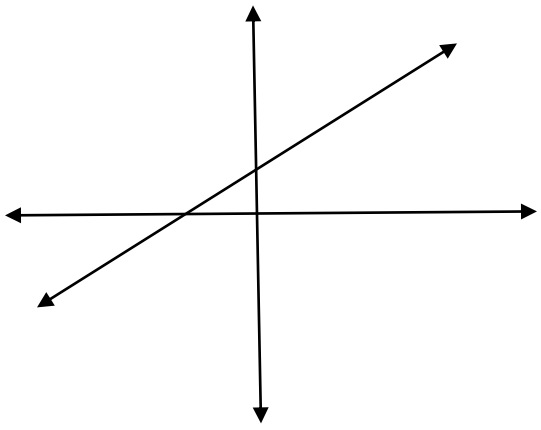
Composite Functions

24. $Given\ f(x) = x - 7\ and\ g(x) = 4x\ \ find\ f\big(g(x)\big)$
25. $Given\ f(x) = x^2\ and\ g(x) = x + 5\ \ find\ g\big(f(x)\big)$
26. $Given\ f(x) = x^2 - 2x\ and\ g(x) = 5x\ \ find\ f\big(g(x)\big)$
27. $Given\ f(x) = 4 - 2x^2\ and\ g(x) = 2 - x\ \ find\ f\big(g(x)\big)$

Graphing Functions

Describe the graph as linear, quadratic or exponential.

28.



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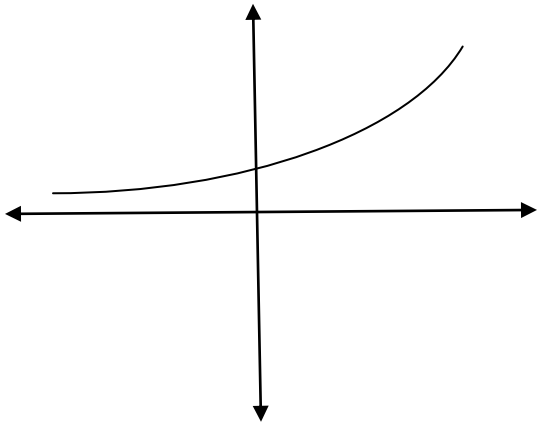

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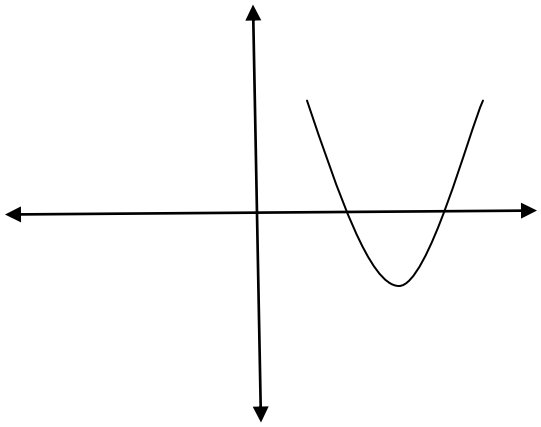


ANSWER KEY

Introduction to Functions and Relations

Determine if the following is a function or relation.

1. $\{(1,2),\ (4,6),\ (-9,0),\ (7,-3)\}$ — $function$
2. $\{(3,8),\ (1,9),\ (-2,-14),\ (3,5)\}$ — $relation$
3. $\{(7,4),\ (8,\ 3),\ (0,0),\ (2,-3),\ (4,1),\ (15,2)\}$ — $function$
4. $\{(10,5),\ (4,\ 2),\ (1,-12),\ (1,-5),\ (0,10),(1,\ 1)\}$ — $relation$
5. $\{(0,-9),\ (-3,7),\ (2,\ 8),\ (-6,-3),\ (-5,\ 2),\ (1,-9)\}$ — $function$
6. $\{(8,2),\ (4,-6),\ (-9,3),\ (3,-9),\ (8,-6)\}$ — $relation$

Evaluate the function for the given value.

7. $f(x) = x + 10,\ \ x = -10$ — 0
8. $f(x) = -3x - 5,\ \ x = -6$ — 13
9. $f(x) = 4x + (8 - x),\ \ x = -5$ — -7
10. $f(x) = \frac{3x+4}{x},\ \ x = 2$ — 5
11. $f(x) = 10(x^2 + x)\ \ x = -4$ — 120

Find the domain of the function

12. $\{(1,2),\ (4,6),\ (-9,0),\ (7,-3)\}$ — $\{1,\ 4,-9,7\}$
13. $\{(7,4),\ (8,\ 3),\ (0,0),\ (2,-3),\ (4,1),\ (15,2)\}$ — $\{7,8,0,2,4,15\}$
14. $\{(0,-9),\ (-3,7),\ (2,\ 8),\ (-6,-3),\ (-5,\ 2),\ (1,-9)\}$ — $\{0,-3,2,-6,-5,1\}$

Function Operations

15. $Given\ f(x) = 2x - 4\ and\ g(x) = 3x + 1\ find\ f(x) + g(x)$ — $5x - 3$
16. $Given\ g(x) = 2x\ and\ f(x) = x - 1\ find\ f(x)g(x)$ — $2x^2 - 2x$
17. $Given\ f(x) = 6\ and\ g(x) = 2x^2 - 1\ find\ f(x) - g(x)$ — $-2x^2 + 7$
18. $Given\ f(x) = x - 2\ and\ g(x) = 6 - 2x$
    $find\ h(-2) where\ h(x) = f(x) + g(x)$ — 6

Inverse Functions

Find the inverse of the function

19. $f(x) = 5x$ $f^{-1}(x) = \frac{x}{5}$
20. $g(x) = 5x - 1$ $g^{-1}(x) = \frac{x+1}{5}$
21. $h(x) = 7x + 10$ $h^{-1}(x) = \frac{x-10}{7}$
22. $f(x) = \frac{x+5}{4}$ $f^{-1}(x) = 4x - 5$
23. $g(x) = \frac{x+9}{2}$ $g^{-1}(x) = 2x - 9$

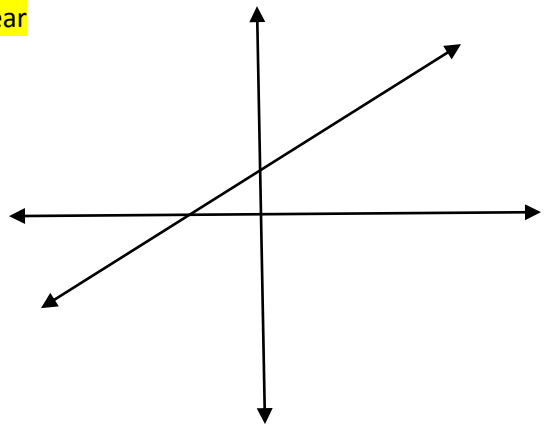
Composite Functions

24. $Given\ f(x) = x - 7\ and\ g(x) = 4x\ \ find\ f(g(x))$ $4x - 7$
25. $Given\ f(x) = x^2\ and\ g(x) = x + 5\ \ find\ g(f(x))$ $x^2 + 5$
26. $Given\ f(x) = x^2 - 2x\ and\ g(x) = 5x\ \ find\ f(g(x))$ $25x^2 - 10x$
27. $Given\ f(x) = 4 - 2x^2\ and\ g(x) = 2 - x\ \ find\ f(g(x))$ $-2x^2 - 8x - 4$

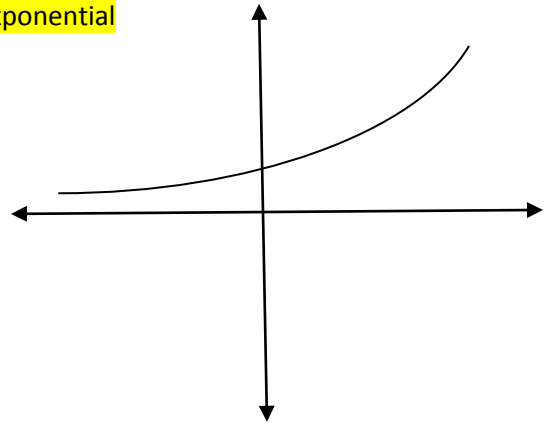
Graphing Functions

Describe the graph as linear, quadratic or exponential.

28. linear



29. exponential



30. quadratic