Functions and sequences Worksheet

Algebra

Name _____ Date _____

Warm-up

1. If $f(x) = 5x + 5$, find $f(0)$.

2. What's the domain of $f(x) = 4x + 2$?
   (A) All real numbers (B) $x \geq 2$ (C) $x \neq 0$ (D) $x > 0$

3. What's the next term? $5, 10, 20, \ldots$

4. Is this a function? $\{(1, 2), (2, 8), (1, 5)\}$
   (A) Yes (B) No

5. What value of x is not allowed in $\dfrac{5}{x - 5}$?

Practice

6. If $f(x) = x^2 + 2x$, find $f(-4)$.

7. What's the range of $y = (x - 1)^2 - 6$?
   (A) $y \leq -6$ (B) $y \geq -1$ (C) All real numbers (D) $y \geq -6$

8. Find term 19 of $1, 3, 5, \ldots$

9. If $f(x) = 5x + 4$ and $f(x) = 39$, find x.

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10. Find the domain of $\sqrt{x-8}$.
    (A) All real numbers (B) $x \geq 8$ (C) $x \leq 8$ (D) $x > 8$

11. Find term 7 of $3, 9, 27, \ldots$

12. A table shows $f(1) = 8$ and $f(2) = 10$. Which is true?
    (A) The input 2 gives the output 10 (B) f times 2 is 10 (C) $f(1)$ equals $f(2)$ (D) The input 10 gives the output 2

13. Find the domain of $\sqrt{3-x}$.
    (A) $x \geq 3$ (B) $x < 3$ (C) $x \leq 3$ (D) All real numbers

Challenge

14. If $f(x) = 2x + 3$ and $g(x) = x - 3$, find $f(g(7))$.

15. What's the range of $y = -x^2 + 9$?
    (A) $y \leq 9$ (B) $y \geq 9$ (C) $y \leq 0$ (D) All real numbers

16. An arithmetic sequence has $a_2 = 8$ and $a_4 = 20$. Find the common difference.

17. If $f(x) = 6x + 2$, what's $f(6+1) - f(6)$?

18. What's the smallest whole number in the domain of $\sqrt{5x-35}$?

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Functions and sequences Worksheet: Answer Key

Algebra

1. 5

   $5(0) + 5 = 5$.

2. (A) All real numbers

   Nothing here can break: any number can be multiplied and added.

3. 40

   Each term is multiplied by 2.

4. (B) No

   The input 1 has two different outputs.

5. 5

   It would make the denominator 0.

6. 8

   $(-4)^2 + 2(-4) = 8$.

7. (D) $y \geq -6$

   A square is at least 0, so y is at least -6.

8. 37

   $1 + (19 - 1)(2)$.

9. 7

   Set $5x + 4 = 39$ and solve.

10. (B) $x \geq 8$

    $x - 8 \geq 0$. Zero under the root is fine.

11. 2187

    $3 \cdot 3^6$.

12. (A) The input 2 gives the output 10

    $f(2) = 10$ means: input 2, output 10.

13. (C) $x \leq 3$

    $3 - x \geq 0$, so subtract 3 and flip: $x \leq 3$.

14. 11

    $g(7) = 4$, then double and add 3.

15. (A) $y \leq 9$

    $-x^2$ is at most 0, so the top value is 9.

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16. 6

    $\frac{20-8}{2}$.

17. 6

    Increasing the input by 1 adds the slope once.

18. 7

    $5x \geq 35$ gives $x \geq 7$.

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