Functions Worksheet

Precalculus

Name _____ Date _____

Warm-up

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

2. $\dfrac{1}{x - -7}$ is undefined at which value?

3. $y = x^2 + 9$ is $y = x^2$ moved...
   (A) down 9 (B) up 9 (C) left 9 (D) right 9

4. $f(x) = 5x - 5$. Find $f(4)$.

5. Which value is NOT in the domain of $\sqrt{x - 11}$?
   (A) 10 (B) 11 (C) 16 (D) 12

Practice

6. From $f(x) = x^2$, find these.
   $f(3) + 1$ _____ $f(3 + 1)$ _____

7. Domain of $\sqrt{6x - 54}$ is $x \geq \square$. Find the value.

8. Find the vertex of $y = (x - 6)^2 + 1$.
   $x =$ _____ $y =$ _____

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9. $f(x) = 7x + 6$. Write $f(t + 1)$ as an expression in t.

10. The inverse of $f(x) = 2x - 9$ is...

11. $y = x^2$ moves left 5 and up 1. Write the new function, expanded.

12. $f(x) = x + 4$ and $g(x) = 5x$. Find $g(f(7))$.

13. $f(5) = 25$. What's $f^{-1}(25)$?

Challenge

14. $f(x) = 4x + 1$ and $f(f(x)) = 16x + k$. Find k.

15. How many integers are in the domain of $\dfrac{\sqrt{3 - x}}{\sqrt{x}}$?

16. $y = |x|$ is flipped and moved up 7. Which is the new equation?
    (A) $y = -|x| + 7$ (B) $y = |x| - 7$ (C) $y = |-x| + 7$ (D) $y = -|x + 7|$

17. $f(x) = x^2$ and $g(x) = x + 6$. Write $f(g(x))$ expanded.

18. Which function has no inverse (without restricting)?
    (A) $y = x^3$ (B) $y = x + 1$ (C) $y = 2x$ (D) $y = x^2$

Functions Worksheet: Answer Key

Precalculus

1. 14

   $(-3)^2 = 9$.

2. -7

   The bottom is zero there.

3. (B) up 9

   Outside additions move vertically.

4. 15

   $5(4) - 5$.

5. (A) 10

   Inside the root must be at least 0.

6. $f(3) + 1$ 10, $f(3 + 1)$ 16

   $f(3) + 1 = 9 + 1$, and $f(3 + 1) = f(4) = 16$. Where the $+1$ sits matters.

7. 9

   $6x - 54 \geq 0$.

8. $x = 6$, $y = 1$

   Read it from the form.

9. $7t + 13$

   $7(t + 1) + 6$.

10. $\dfrac{x - (-9)}{2}$

    Swap x and y, then solve.

11. $x^2 + 10x + 26$

    $(x + 5)^2 + 1$.

12. 55

    $f(7) = 11$, then multiply by 5.

13. 5

    The inverse undoes f.

14. 5

    $4(4x + 1) + 1$.

15. 3

    x must be above 0 and at most 3.

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16. (A) $y = -|x| + 7$

    Flip means an outside minus, and up adds outside.

17. $x^2 + 12x + 36$

    $(x + 6)^2$.

18. (D) $y = x^2$

    Both 2 and -2 give 4, so it can't be undone.

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