Reading Function Values

Name: _____	Date: _____	Score: _____ / 24

Quick Review

Function notation $f(x)$ is just a name tag for the output. When you see $f(3)$, it means "the output of the function f when the input is 3." To find it, **substitute** the number wherever x appears, then simplify. For example, if $f(x) = 2x + 1$, then $f(3) = 2(3) + 1 = 7$. The letter doesn't matter — $g(t)$ or $h(n)$ work the same way. Be careful with negatives: always put the input inside parentheses before you simplify, so signs don't get lost.

◇ **Example:** If $f(x) = 3x - 4$, find $f(5)$ and $f(-2)$.
⇒ For $f(5)$, replace every x with 5: $f(5) = 3(5) - 4 = 15 - 4 = 11$. For $f(-2)$, replace x with -2 — and notice the parentheses keep the sign safe: $f(-2) = 3(-2) - 4 = -6 - 4 = -10$. Substitute first, then do the arithmetic. That's the whole trick!

Answer: $f(5) = 11,\ \ f(-2) = -10$

PRACTICE

Evaluate each function at the given input.

1. $f(x) = x + 6;\ \ f(2)$ _____
2. $f(x) = x - 9;\ \ f(15)$ _____
3. $f(x) = 4x;\ \ f(3)$ _____
4. $f(x) = 2x + 1;\ \ f(6)$ _____
5. $f(x) = 5x - 3;\ \ f(4)$ _____
6. $f(x) = 3x + 7;\ \ f(0)$ _____
7. $f(x) = x + 6;\ \ f(-4)$ _____
8. $f(x) = 2x - 5;\ \ f(-3)$ _____
9. $g(t) = 6t + 2;\ \ g(5)$ _____
10. $g(t) = 10 - t;\ \ g(7)$ _____
11. $h(n) = -2n + 8;\ \ h(3)$ _____
12. $h(n) = -n - 1;\ \ h(-5)$ _____
13. $f(x) = x^2;\ \ f(4)$ _____
14. $f(x) = x^2 + 1;\ \ f(-3)$ _____
15. $f(x) = \frac{x}{2} + 4;\ \ f(8)$ _____
16. $f(x) = \frac{1}{3}x - 2;\ \ f(9)$ _____
17. $f(x) = 7x;\ \ f(-2)$ _____
18. $g(x) = 3x - 10;\ \ g(10)$ _____
19. $f(x) = 2x^2 - 3;\ \ f(2)$ _____
20. $f(x) = -4x + 1;\ \ f(-1)$ _____

Word Problems

21. A phone plan costs $C(m) = 0.10m + 20$ dollars, where m is the number of minutes used. Find $C(150)$ and explain what it means. _____

22. A diver's depth in feet is $d(t) = -6t$, where t is the number of seconds since the dive started. Find $d(8)$ and say what it tells you. _____

23. A bakery's profit is $P(x) = 4x - 50$ dollars when it sells x cakes. Find $P(20)$ and explain whether the bakery made or lost money. _____

24. The height of a ball in feet is $h(t) = 40 - 5t^2$, where t is the time in seconds. Find $h(2)$ and explain what it represents. _____

Answer Keys

1. $\boxed{8}$
2. $\boxed{6}$
3. $\boxed{12}$
4. $\boxed{13}$
5. $\boxed{17}$
6. $\boxed{7}$
7. $\boxed{2}$
8. $\boxed{-11}$
9. $\boxed{32}$
10. $\boxed{3}$
11. $\boxed{2}$
12. $\boxed{4}$
13. $\boxed{16}$
14. $\boxed{10}$
15. $\boxed{8}$
16. $\boxed{1}$
17. $\boxed{-14}$
18. $\boxed{20}$
19. $\boxed{5}$
20. $\boxed{5}$
21. $\boxed{C(150) = 35}$; the plan costs \$35 for 150 minutes
22. $\boxed{d(8) = -48}$; the diver is 48 feet below the surface
23. $\boxed{P(20) = 30}$; the bakery made \$30 profit
24. $\boxed{h(2) = 20}$; the ball is 20 feet high after 2 seconds

Step-by-Step Explanations

1. Substitute $x = 2$: $f(2) = 2 + 6 = 8$.
2. Substitute $x = 15$: $f(15) = 15 - 9 = 6$.
3. Substitute $x = 3$: $f(3) = 4(3) = 12$.
4. Substitute $x = 6$: $f(6) = 2(6) + 1 = 12 + 1 = 13$.
5. Substitute $x = 4$: $f(4) = 5(4) - 3 = 20 - 3 = 17$.
6. Substitute $x = 0$: $f(0) = 3(0) + 7 = 0 + 7 = 7$.
7. Substitute $x = -4$: $f(-4) = -4 + 6 = 2$.
8. Substitute $x = -3$: $f(-3) = 2(-3) - 5 = -6 - 5 = -11$.
9. Substitute $t = 5$: $g(5) = 6(5) + 2 = 30 + 2 = 32$.
10. Substitute $t = 7$: $g(7) = 10 - 7 = 3$.
11. Substitute $n = 3$: $h(3) = -2(3) + 8 = -6 + 8 = 2$.
12. Substitute $n = -5$: $h(-5) = -(-5) - 1 = 5 - 1 = 4$.
13. Substitute $x = 4$: $f(4) = 4^2 = 16$.
14. Substitute $x = -3$: $f(-3) = (-3)^2 + 1 = 9 + 1 = 10$.
15. Substitute $x = 8$: $f(8) = \frac{8}{2} + 4 = 4 + 4 = 8$.
16. Substitute $x = 9$: $f(9) = \frac{1}{3}(9) - 2 = 3 - 2 = 1$.
17. Substitute $x = -2$: $f(-2) = 7(-2) = -14$.
18. Substitute $x = 10$: $g(10) = 3(10) - 10 = 30 - 10 = 20$.
19. Substitute $x = 2$: $f(2) = 2(2)^2 - 3 = 2(4) - 3 = 8 - 3 = 5$.
20. Substitute $x = -1$: $f(-1) = -4(-1) + 1 = 4 + 1 = 5$.
21. Substitute $m = 150$: $C(150) = 0.10(150) + 20 = 15 + 20 = 35$. So using 150 minutes makes the bill \$35.
22. Substitute $t = 8$: $d(8) = -6(8) = -48$. The negative sign means 48 feet *below* the surface after 8 seconds.
23. Substitute $x = 20$: $P(20) = 4(20) - 50 = 80 - 50 = 30$. Since 30 is positive, the bakery earned a \$30 profit.
24. Substitute $t = 2$: $h(2) = 40 - 5(2)^2 = 40 - 5(4) = 40 - 20 = 20$. After 2 seconds the ball is 20 feet above the ground.

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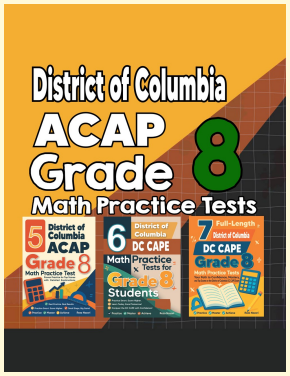

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