

# Reading Function Values

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 24

## Q 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. $f(x) = x + 6$ ; $f(2)$   | _____ | 11. $h(n) = -2n + 8$ ; $h(3)$          | _____ |
| 2. $f(x) = x - 9$ ; $f(15)$  | _____ | 12. $h(n) = -n - 1$ ; $h(-5)$          | _____ |
| 3. $f(x) = 4x$ ; $f(3)$      | _____ | 13. $f(x) = x^2$ ; $f(4)$              | _____ |
| 4. $f(x) = 2x + 1$ ; $f(6)$  | _____ | 14. $f(x) = x^2 + 1$ ; $f(-3)$         | _____ |
| 5. $f(x) = 5x - 3$ ; $f(4)$  | _____ | 15. $f(x) = \frac{x}{2} + 4$ ; $f(8)$  | _____ |
| 6. $f(x) = 3x + 7$ ; $f(0)$  | _____ | 16. $f(x) = \frac{1}{3}x - 2$ ; $f(9)$ | _____ |
| 7. $f(x) = x + 6$ ; $f(-4)$  | _____ | 17. $f(x) = 7x$ ; $f(-2)$              | _____ |
| 8. $f(x) = 2x - 5$ ; $f(-3)$ | _____ | 18. $g(x) = 3x - 10$ ; $g(10)$         | _____ |
| 9. $g(t) = 6t + 2$ ; $g(5)$  | _____ | 19. $f(x) = 2x^2 - 3$ ; $f(2)$         | _____ |
| 10. $g(t) = 10 - t$ ; $g(7)$ | _____ | 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. <input type="text" value="8"/>   | 13. <input type="text" value="16"/>  |
| 2. <input type="text" value="6"/>   | 14. <input type="text" value="10"/>  |
| 3. <input type="text" value="12"/>  | 15. <input type="text" value="8"/>   |
| 4. <input type="text" value="13"/>  | 16. <input type="text" value="1"/>   |
| 5. <input type="text" value="17"/>  | 17. <input type="text" value="-14"/>   |
| 6. <input type="text" value="7"/>   | 18. <input type="text" value="20"/>  |
| 7. <input type="text" value="2"/>   | 19. <input type="text" value="5"/>   |
| 8. <input type="text" value="-11"/> | 20. <input type="text" value="5"/>   |
| 9. <input type="text" value="32"/>  | 21. <input type="text" value="C(150) = 35; the plan costs \$35 for 150 minutes"/>    |
| 10. <input type="text" value="3"/>  | 22. <input type="text" value="d(8) = -48; the diver is 48 feet below the surface"/>  |
| 11. <input type="text" value="2"/>  | 23. <input type="text" value="P(20) = 30; the bakery made \$30 profit"/>             |
| 12. <input type="text" value="4"/>  | 24. <input type="text" value="h(2) = 20; the ball is 20 feet high after 2 seconds"/> |

### Step-by-Step Explanations

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



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