



Name: _____

Date: _____

Score: / 30

Learning Objectives

- Evaluate a function using function notation $f(x)$
- Determine the domain and range of a function
- Compute slope and write the equation of a line
- Find the composition and inverse of a function

Simplify each expression completely. Show all steps and circle your final answer.

Domain of functions

1. Find the domain of $g(x) = 1 / (x - -5)$. State any values of x that must be excluded.

$$g(x) = \frac{1}{x - -5}$$

Answer: _____

2. Find the domain of $g(x) = 1 / (x - 1)$. State any values of x that must be excluded.

$$g(x) = \frac{1}{x - 1}$$

Answer: _____

3. Find the domain of $g(x) = 4 / (x - -1)$. State any values of x that must be excluded.

$$g(x) = \frac{4}{x - -1}$$

Answer: _____

4. Find the domain of $g(x) = 2 / (x - 2)$. State any values of x that must be excluded.

$$g(x) = \frac{2}{x - 2}$$

Answer: _____

5. Find the domain of $g(x) = 5 / (x - -2)$. State any values of x that must be excluded.

$$g(x) = \frac{5}{x - -2}$$

Answer: _____

6. Find the domain of $g(x) = 5 / (x - -3)$. State any values of x that must be excluded.

$$g(x) = \frac{5}{x - -3}$$

Answer: _____

7. Find the domain of $g(x) = 1 / (x - -1)$. State any values of x that must be excluded.

$$g(x) = \frac{1}{x - -1}$$

Answer: _____

8. Find the domain of $g(x) = 1 / (x - -1)$. State any values of x that must be excluded.

$$g(x) = \frac{1}{x - -1}$$

Answer: _____

Evaluating functions

9. A company's revenue is modeled by $R(x) = 12x + 246$, where x is units sold. Find $R(9)$.

$$f(x) = 12x + 246, \quad x = 9$$

Answer: _____

10. A profit function is $P(x) = -1x^2 + 183$. Find $P(6)$.

$$-1x^2 + 183, \quad x = 6$$

Answer: _____

11. A cost function is $C(x) = 13x + 627$ dollars, where x is the number of items produced. Find $C(25)$ and interpret the result.

$$f(x) = 13x + 627, \quad x = 25$$

Answer: _____

12. A company's revenue is modeled by $R(x) = 32x + 132$, where x is units sold. Find $R(18)$.

$$f(x) = 32x + 132, \quad x = 18$$

Answer: _____

13. A profit function is $P(x) = -2x^2 + 83$. Find $P(6)$.

$$-2x^2 + 83, \quad x = 6$$

Answer: _____

14. A cost function is $C(x) = 7x + 552$ dollars, where x is the number of items produced. Find $C(23)$ and interpret the result.

$$f(x) = 7x + 552, \quad x = 23$$

Answer: _____

15. A company's revenue is modeled by $R(x) = 25x + 357$, where x is units sold. Find $R(10)$.

$$f(x) = 25x + 357, \quad x = 10$$

Answer: _____

16. A profit function is $P(x) = -2x^2 + 63$. Find $P(6)$.

$$-2x^2 + 63, \quad x = 6$$

Answer: _____

17. A cost function is $C(x) = 24x + 421$ dollars, where x is the number of items produced. Find $C(24)$ and interpret the result.

$$f(x) = 24x + 421, \quad x = 24$$

Answer: _____

18. A company's revenue is modeled by $R(x) = 15x + 200$, where x is units sold. Find $R(9)$.

$$f(x) = 15x + 200, \quad x = 9$$

Answer: _____

19. A profit function is $P(x) = -4x^2 + 171$. Find $P(6)$.

$$-4x^2 + 171, \quad x = 6$$

Answer: _____

20. A cost function is $C(x) = 6x + 576$ dollars, where x is the number of items produced. Find $C(28)$ and interpret the result.

$$f(x) = 6x + 576, \quad x = 28$$

Answer: _____

21. A company's revenue is modeled by $R(x) = 24x + 143$, where x is units sold. Find $R(19)$.

$$f(x) = 24x + 143, \quad x = 19$$

Answer: _____

22. A profit function is $P(x) = -2x^2 + 122$. Find $P(6)$.

$$-2x^2 + 122, \quad x = 6$$

Answer: _____

23. A cost function is $C(x) = 20x + 386$ dollars, where x is the number of items produced. Find $C(27)$ and interpret the result.

$$f(x) = 20x + 386, \quad x = 27$$

Answer: _____

24. A company's revenue is modeled by $R(x) = 38x + 327$, where x is units sold. Find $R(14)$.

$$f(x) = 38x + 327, \quad x = 14$$

Answer: _____

25. A profit function is $P(x) = -1x^2 + 81$. Find $P(6)$.

$$-1x^2 + 81, \quad x = 6$$

Answer: _____

26. A cost function is $C(x) = 18x + 495$ dollars, where x is the number of items produced. Find $C(19)$ and interpret the result.

$$f(x) = 18x + 495, \quad x = 19$$

Answer: _____

27. A company's revenue is modeled by $R(x) = 14x + 159$, where x is units sold. Find $R(18)$.

$$f(x) = 14x + 159, \quad x = 18$$

Answer: _____

28. A profit function is $P(x) = -1x^2 + 178$. Find $P(2)$.

$$-1x^2 + 178, \quad x = 2$$

Answer: _____

29. A cost function is $C(x) = 26x + 238$ dollars, where x is the number of items produced. Find $C(13)$ and interpret the result.

$$f(x) = 26x + 238, \quad x = 13$$

Answer: _____

30. A company's revenue is modeled by $R(x) = 30x + 360$, where x is units sold. Find $R(5)$.

$$f(x) = 30x + 360, \quad x = 5$$

Answer: _____



MATH120: Functions and Graphs

Introduction to Statistics · C-ID MATH120 · numberbender.com

ANSWER KEY & SOLUTIONS

Topics: Evaluating functions, Domain of functions. All answers verified by independent computation.

Solutions

Domain of functions

1. Find the domain of $g(x) = 1 / (x - -5)$. State any values of x that must be excluded.

$$g(x) = \frac{1}{x - -5}$$

→ Set denominator not equal to zero: $x - -5 \neq 0 \rightarrow x \neq -5$.

→ Domain: all real numbers except $x = -5$.

Answer: $x \neq -5$

2. Find the domain of $g(x) = 1 / (x - 1)$. State any values of x that must be excluded.

$$g(x) = \frac{1}{x - 1}$$

→ Set denominator not equal to zero: $x - 1 \neq 0 \rightarrow x \neq 1$.

→ Domain: all real numbers except $x = 1$.

Answer: $x \neq 1$

3. Find the domain of $g(x) = 4 / (x - -1)$. State any values of x that must be excluded.

$$g(x) = \frac{4}{x - -1}$$

→ Set denominator not equal to zero: $x - -1 \neq 0 \rightarrow x \neq -1$.

→ Domain: all real numbers except $x = -1$.

Answer: $x \neq -1$

4. Find the domain of $g(x) = 2 / (x - 2)$. State any values of x that must be excluded.

$$g(x) = \frac{2}{x - 2}$$

→ Set denominator not equal to zero: $x - 2 \neq 0 \rightarrow x \neq 2$.

→ Domain: all real numbers except $x = 2$.

Answer: $x \neq 2$

5. Find the domain of $g(x) = 5 / (x - -2)$. State any values of x that must be excluded.

$$g(x) = \frac{5}{x - -2}$$

→ Set denominator not equal to zero: $x - -2 \neq 0 \rightarrow x \neq -2$.

→ Domain: all real numbers except $x = -2$.

Answer: $x \neq -2$

6. Find the domain of $g(x) = 5 / (x - -3)$. State any values of x that must be excluded.

$$g(x) = \frac{5}{x - -3}$$

→ Set denominator not equal to zero: $x - -3 \neq 0 \rightarrow x \neq -3$.

→ Domain: all real numbers except $x = -3$.

Answer: $x \neq -3$

7. Find the domain of $g(x) = 1 / (x - -1)$. State any values of x that must be excluded.

$$g(x) = \frac{1}{x - -1}$$

→ Set denominator not equal to zero: $x - -1 \neq 0 \rightarrow x \neq -1$.

→ Domain: all real numbers except $x = -1$.

Answer: $x \neq -1$

8. Find the domain of $g(x) = 1 / (x - -1)$. State any values of x that must be excluded.

$$g(x) = \frac{1}{x - -1}$$

→ Set denominator not equal to zero: $x - -1 \neq 0 \rightarrow x \neq -1$.

→ Domain: all real numbers except $x = -1$.

Answer: $x \neq -1$

Evaluating functions

9. A company's revenue is modeled by $R(x) = 12x + 246$, where x is units sold. Find $R(9)$.

$$f(x) = 12x + 246, \quad x = 9$$

$$\rightarrow \text{Substitute } x = 9: R(9) = 12(9) + 246.$$

$$\rightarrow = 108 + 246 = 354.$$

Answer: $f(9) = 354$

10. A profit function is $P(x) = -1x^2 + 183$. Find $P(6)$.

$$-1x^2 + 183, \quad x = 6$$

$$\rightarrow \text{Substitute } x = 6: P(6) = -1(6)^2 + 183.$$

$$\rightarrow = -1(36) + 183 = -36 + 183 = 147.$$

Answer: $-1(6)^2 + 183 = -36 + 183 = 147$

11. A cost function is $C(x) = 13x + 627$ dollars, where x is the number of items produced. Find $C(25)$ and interpret the result.

$$f(x) = 13x + 627, \quad x = 25$$

$$\rightarrow C(25) = 13(25) + 627 = 325 + 627 = 952.$$

$$\rightarrow \text{It costs } \$952 \text{ to produce 25 items.}$$

Answer: $f(25) = 952$

12. A company's revenue is modeled by $R(x) = 32x + 132$, where x is units sold. Find $R(18)$.

$$f(x) = 32x + 132, \quad x = 18$$

$$\rightarrow \text{Substitute } x = 18: R(18) = 32(18) + 132.$$

$$\rightarrow = 576 + 132 = 708.$$

Answer: $f(18) = 708$

13. A profit function is $P(x) = -2x^2 + 83$. Find $P(6)$.

$$-2x^2 + 83, \quad x = 6$$

$$\rightarrow \text{Substitute } x = 6: P(6) = -2(6)^2 + 83.$$

$$\rightarrow = -2(36) + 83 = -72 + 83 = 11.$$

Answer: $-2(6)^2 + 83 = -72 + 83 = 11$

14. A cost function is $C(x) = 7x + 552$ dollars, where x is the number of items produced. Find $C(23)$ and interpret the result.

$$f(x) = 7x + 552, \quad x = 23$$

$$\rightarrow C(23) = 7(23) + 552 = 161 + 552 = 713.$$

$$\rightarrow \text{It costs } \$713 \text{ to produce 23 items.}$$

Answer: $f(23) = 713$

15. A company's revenue is modeled by $R(x) = 25x + 357$, where x is units sold. Find $R(10)$.

$$f(x) = 25x + 357, \quad x = 10$$

$$\rightarrow \text{Substitute } x = 10: R(10) = 25(10) + 357.$$

$$\rightarrow = 250 + 357 = 607.$$

Answer: $f(10) = 607$

16. A profit function is $P(x) = -2x^2 + 63$. Find $P(6)$.

$$-2x^2 + 63, \quad x = 6$$

$$\rightarrow \text{Substitute } x = 6: P(6) = -2(6)^2 + 63.$$

$$\rightarrow = -2(36) + 63 = -72 + 63 = -9.$$

Answer: $-2(6)^2 + 63 = -72 + 63 = -9$

17. A cost function is $C(x) = 24x + 421$ dollars, where x is the number of items produced. Find $C(24)$ and interpret the result.

$$f(x) = 24x + 421, \quad x = 24$$

$$\rightarrow C(24) = 24(24) + 421 = 576 + 421 = 997.$$

$$\rightarrow \text{It costs } \$997 \text{ to produce } 24 \text{ items.}$$

Answer: $f(24) = 997$

18. A company's revenue is modeled by $R(x) = 15x + 200$, where x is units sold. Find $R(9)$.

$$f(x) = 15x + 200, \quad x = 9$$

$$\rightarrow \text{Substitute } x = 9: R(9) = 15(9) + 200.$$

$$\rightarrow = 135 + 200 = 335.$$

Answer: $f(9) = 335$

19. A profit function is $P(x) = -4x^2 + 171$. Find $P(6)$.

$$-4x^2 + 171, \quad x = 6$$

$$\rightarrow \text{Substitute } x = 6: P(6) = -4(6)^2 + 171.$$

$$\rightarrow = -4(36) + 171 = -144 + 171 = 27.$$

Answer: $-4(6)^2 + 171 = -144 + 171 = 27$

20. A cost function is $C(x) = 6x + 576$ dollars, where x is the number of items produced. Find $C(28)$ and interpret the result.

$$f(x) = 6x + 576, \quad x = 28$$

$$\rightarrow C(28) = 6(28) + 576 = 168 + 576 = 744.$$

$$\rightarrow \text{It costs } \$744 \text{ to produce } 28 \text{ items.}$$

Answer: $f(28) = 744$

21. A company's revenue is modeled by $R(x) = 24x + 143$, where x is units sold. Find $R(19)$.

$$f(x) = 24x + 143, \quad x = 19$$

$$\rightarrow \text{Substitute } x = 19: R(19) = 24(19) + 143.$$

$$\rightarrow = 456 + 143 = 599.$$

Answer: $f(19) = 599$

22. A profit function is $P(x) = -2x^2 + 122$. Find $P(6)$.

$$-2x^2 + 122, \quad x = 6$$

$$\rightarrow \text{Substitute } x = 6: P(6) = -2(6)^2 + 122.$$

$$\rightarrow = -2(36) + 122 = -72 + 122 = 50.$$

Answer: $-2(6)^2 + 122 = -72 + 122 = 50$

23. A cost function is $C(x) = 20x + 386$ dollars, where x is the number of items produced. Find $C(27)$ and interpret the result.

$$f(x) = 20x + 386, \quad x = 27$$

$$\rightarrow C(27) = 20(27) + 386 = 540 + 386 = 926.$$

$$\rightarrow \text{It costs } \$926 \text{ to produce } 27 \text{ items.}$$

Answer: $f(27) = 926$

24. A company's revenue is modeled by $R(x) = 38x + 327$, where x is units sold. Find $R(14)$.

$$f(x) = 38x + 327, \quad x = 14$$

$$\rightarrow \text{Substitute } x = 14: R(14) = 38(14) + 327.$$

$$\rightarrow = 532 + 327 = 859.$$

Answer: $f(14) = 859$

25. A profit function is $P(x) = -1x^2 + 81$. Find $P(6)$.

$$-1x^2 + 81, \quad x = 6$$

$$\rightarrow \text{Substitute } x = 6: P(6) = -1(6)^2 + 81.$$

$$\rightarrow = -1(36) + 81 = -36 + 81 = 45.$$

Answer: $-1(6)^2 + 81 = -36 + 81 = 45$

26. A cost function is $C(x) = 18x + 495$ dollars, where x is the number of items produced. Find $C(19)$ and interpret the result.

$$f(x) = 18x + 495, \quad x = 19$$

$$\rightarrow C(19) = 18(19) + 495 = 342 + 495 = 837.$$

$$\rightarrow \text{It costs } \$837 \text{ to produce } 19 \text{ items.}$$

Answer: $f(19) = 837$

27. A company's revenue is modeled by $R(x) = 14x + 159$, where x is units sold. Find $R(18)$.

$$f(x) = 14x + 159, \quad x = 18$$

$$\rightarrow \text{Substitute } x = 18: R(18) = 14(18) + 159.$$

$$\rightarrow = 252 + 159 = 411.$$

Answer: $f(18) = 411$

28. A profit function is $P(x) = -1x^2 + 178$. Find $P(2)$.

$$-1x^2 + 178, \quad x = 2$$

$$\rightarrow \text{Substitute } x = 2: P(2) = -1(2)^2 + 178.$$

$$\rightarrow = -1(4) + 178 = -4 + 178 = 174.$$

Answer: $-1(2)^2 + 178 = -4 + 178 = 174$

29. A cost function is $C(x) = 26x + 238$ dollars, where x is the number of items produced. Find $C(13)$ and interpret the result.

$$f(x) = 26x + 238, \quad x = 13$$

$$\rightarrow C(13) = 26(13) + 238 = 338 + 238 = 576.$$

$$\rightarrow \text{It costs } \$576 \text{ to produce } 13 \text{ items.}$$

Answer: $f(13) = 576$

30. A company's revenue is modeled by $R(x) = 30x + 360$, where x is units sold. Find $R(5)$.

$$f(x) = 30x + 360, \quad x = 5$$

$$\rightarrow \text{Substitute } x = 5: R(5) = 30(5) + 360.$$

$$\rightarrow = 150 + 360 = 510.$$

Answer: $f(5) = 510$
