

## 7.1 Start Thinking

Use a table to make a list of at least five different objects around you. Choose a letter of the alphabet (not “o” because it may be confused with zero) to represent each object. If you choose the same letter for more than one object, choose an exponent greater than one to accompany the letter for each duplicate. Denote how many of each object there are in the room.

Write an expression so that the number denoting how many there are of each object is in front of the letter representing that object (for example, three tables would be  $3t$ , if  $t$  represents tables).

Separate each object with a plus sign.

## 7.1 Warm Up

**Simplify.**

1.  $2 + (-17)$

2.  $7 - 6$

3.  $-38 + (-14)$

4.  $14 - (-24)$

5.  $0 + (-9)$

6.  $6 - 15$

## 7.1 Cumulative Review Warm Up

**Solve the system of linear equations by elimination. Check your solution.**

1.  $x + y = 8$

$x - y = 6$

2.  $x - 3y = -7$

$x + 2y = 18$

3.  $4x - 5y = -114$

$x + 2y = 30$

4.  $x + 3y = 4$

$3x - 9y = -6$

**7.1****Practice A**

In Exercises 1–3, find the degree of the monomial.

1.  $7n^3$

2.  $\frac{1}{3}x^5$

3.  $w^2y^5$

In Exercises 4–6, write the polynomial in standard form. Identify the degree and leading coefficient of the polynomial. Then classify the polynomial by the number of terms.

4.  $5h - 4h^3 - 2$

5.  $10 + 4p^3$

6.  $6v^7$

7. The expression  $-16t^2 + 20t + 100$  represents the height of an object  $t$  seconds after it is dropped from a height of 100 feet. Why is this expression a trinomial? What is its degree?

In Exercises 8–11, find the sum.

8.  $(7t + 6) + (-4t - 2)$

9.  $(-12v + 3) + (8v - 7)$

10.  $(3j^2 - 7j + 1) + (-6j^2 - 4j + 9)$

11.  $(2w^2 - 7w + 3) + (2w^2 + 8w)$

In Exercises 12–15, find the difference.

12.  $(p - 5) - (4p - 7)$

13.  $(8w + 3) - (9w + 6)$

14.  $(3y^2 - 6y + 9) - (6y^2 - 7y - 2)$

15.  $(5b^2 - 6b - 9) - (-2b^2 + 8b - 1)$

16. Describe and correct the error in finding the sum.

$$\begin{aligned} \times (x^3 - 8x + 2) + (3x^3 + 7x + 6) &= x^3 - 8x + 2 + 3x^3 + 7x + 6 \\ &= (x^3 + 3x^3) - (8x + 7x) + (2 + 6) \\ &= 4x^3 - 15x + 8 \end{aligned}$$

In Exercises 17 and 18, find the sum or difference.

17.  $(3p^2 - 6pq + 7q^2) - (p^2 - 5pq + 9q^2)$

18.  $(x^2 - 4xy + 9y^2) + (-8x^2 + 6xy - y^2)$

19. Your friend says that when subtracting polynomials, the order in which you subtract does not matter. Is your friend correct? Explain.

**7.1 Practice B**

In Exercises 1–3, find the degree of the monomial.

1.  $-3.25n^8$

2.  $\frac{1}{5}x^4yz^2$

3.  $uv^3w^9$

In Exercises 4–6, write the polynomial in standard form. Identify the degree and leading coefficient of the polynomial. Then classify the polynomial by the number of terms.

4.  $3t - 8t^2 + 10t^5$

5.  $\frac{2}{9}n^2 - \pi n + 3n^4$

6.  $\sqrt{14}p^5$

7. The monthly profit for a small company is represented by  $250x^5 - 42x^2 + 112x$ , where  $x$  is the number of beds sold. Classify the polynomial by the number of terms. What is its degree?

In Exercises 8–11, find the sum.

8.  $(-2t^2 - 7t + 5) + (-8t^2 + 4t - 3)$

9.  $(8y^2 - 2y + 4) + (5y^2 - 7y)$

10.  $(3k - 5k^3 + 9) + (8k^3 - 4k + 8)$

11.  $(3q^2 - 7q - 6) + (2q^2 - 5q^3 + 8q)$

In Exercises 12–15, find the difference.

12.  $(t^3 - 5t^2 - 7) - (t - 11)$

13.  $(-w - 13) - (-3w^3 + w^2 + 6w)$

14.  $(x^4 - x^2 + 9) - (13 - 6x^2 + 8x)$

15.  $(3g - 5g^3 + 6g^2) - (12g^3 + 9g - 10)$

16. The number of economy-size cars rented in  $w$  weeks is represented by  $152 + 3w$ . The number of full-size cars rented in  $w$  weeks is represented by  $99 + 2w$ . Write a polynomial that represents how many more economy cars are rented in  $w$  weeks than full-size cars.

In Exercises 17 and 18, find the sum or difference.

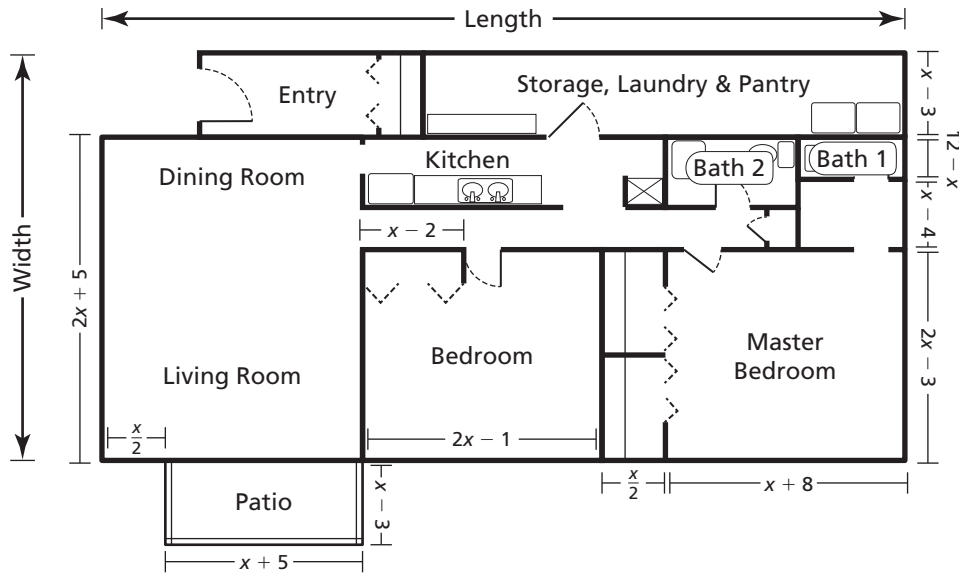
17.  $(g^2 - 9h^2) + (g^2 - 15gh + 8h^2)$

18.  $(-m^2 - 5mn) - (m^2 + 3mn - 9n^2)$

19. The polynomial  $-16t^2 + v_0t + s_0$  represents the height (in feet) of an object, where  $v_0$  is the initial vertical velocity (in feet per second),  $s_0$  is the initial height of the object (in feet), and  $t$  is the time (in seconds). Write a polynomial that represents the height of an object that has initial velocity 25 feet per second and initial height 4 feet. Then find the height of the object after 1 second.

# 7.1 Enrichment and Extension

## House Plans



Use the diagram above to answer the following questions. All measurements are in feet.

- Find the length of the two-bedroom apartment in terms of  $x$ .
- Find the width of the two-bedroom apartment, not including the patio, in terms of  $x$ .
- Find the perimeter of the whole apartment, including the patio, in terms of  $x$ .
- Find the perimeter of the living/dining area in terms of  $x$ .
- Find the perimeter of the master bedroom, including the two closets, in terms of  $x$ .
- The perimeter of the living/dining area is 83 feet. What is the value of  $x$ ?  
Be sure to include units of measure.
- The perimeter of the master bedroom, including the two closets, is 73 feet. What is the value of  $x$ ?
- The length of the apartment is 57 feet. What is the value of  $x$ ?
- Find the area of the whole apartment, excluding the patio, in terms of  $x$ .
- Find the area of the whole apartment, including the patio, in terms of  $x$ .
- The area of the kitchen is  $x^2 - 5x + 6$ . What is the width of the kitchen?

# 7.1 Puzzle Time

## How Does A Flea Travel So Fast?

Write the letter of each answer in the box containing the exercise number.

**Find the sum or difference.**

1.  $(6x + 5) + (-3x + 7)$
2.  $(-9x - 13) + (8x + 3)$
3.  $(2x - 8) - (4x - 2)$
4.  $(5x + 8) - (6x + 2)$
5.  $(3x^2 - 6x - 7) + (-2x^2 - 4x + 12)$
6.  $(-x^2 - 5x + 8) - (4x^2 - 7x - 10)$
7.  $(6x^2 - 3x + 10) - (-6x^2 + 11x + 9)$
8.  $(-13x^3 + 15x^2 - 12x) + (-x^3 - 4x^2 - 15x + 1)$
9.  $(7x^3 - x + 14) - (2x^2 - 19)$
10.  $(8x - 3x^3 - 5) + (4x^3 - 6x^2 + 11)$
11.  $(-5x - 16) - (-3x^3 + 2x^2 + 9x)$

**Answers**

- Y.  $-x - 10$
- H.  $x^3 - 6x^2 + 8x + 6$
- C.  $-5x^2 + 2x + 18$
- I.  $3x + 12$
- G.  $-14x^3 + 11x^2 - 27x + 1$
- B.  $x^2 - 10x + 5$
- I.  $7x^3 - 2x^2 - x + 33$
- K.  $12x^2 - 14x + 1$
- N.  $-2x - 6$
- H.  $21x^2 + 5x + 8$
- T.  $3x^3 - 2x^2 - 14x - 16$
- I.  $-x + 6$

12. The amount of merchandise (in millions) that store *A* sold can be represented by  $A = 13x^2 + 8x - 3$ . The amount of merchandise (in millions) that store *B* sold can be represented by  $B = 8x^2 - 3x + 11$ . Find the total amount of merchandise that stores *A* and *B* sold.

5	2		9	11	6	12	-	10	1	7	4	3	8
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