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Lesson 7.3 Simplifying Algebraic Expressions

Simplify each expression. Then state the coefficient of the variable in each expression.

1. $x + x + 3 + 4$

= _____

2. $k - k + k - 3$

= _____

Simplify each expression.

3. $6g - 3g + 8g - g$

= _____

4. $10u + 4u - 8u - 3u$

= _____

5. $9m + 4m - 5m + 3m$

= _____

6. $12x - 4x + 3x + 5x$

= _____

State whether each pair of expressions are equivalent.

7. $8z + 2z$ and $3z + 4z + 3z$

_____

8. $9y$ and $9 + y$

_____

9. $7n - 2$ and $2 - 7n$

_____

10. $5g - 2g$ and $\frac{18g}{6}$

_____

Simplify each expression.

11. $12 - 8 + 5d + 4d - 6d$

= _____

12. $20 + 7k - 12 - 5k + 8k$

= _____

13. $9m + 11 - 8m - 6 + 5m$

= _____

14. $18 + 4n - 9 + 8n - 11n$

= _____

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Simplify each expression.

15. $20 + 5u + 10u - 20 - 14u$

= _____

16. $20 + 12k - 7k - 8$

= _____

17. $6x + 15 + 9x - 10x - 8$

= _____

18. $r + 9 + 10r - 5 - 4r$

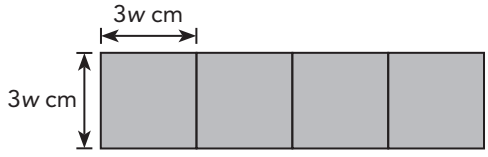
= _____

Solve.

19. Peggy bought 2 racing cars for $\$5x$ each and 3 model motorcycles for $\$3x$ each. Find the amount of money Peggy paid in terms of x.

20. Kevin works $3z$ hours each day from Monday to Friday. He works $(4z - 7)$ on Saturday. Kevin does not work on Sunday. Find the number of hours Kevin works in one week in terms of z.

21. The length of a square tile is $3w$ centimeters. Alice places 4 square tiles in a row to form a figure as shown below. Find the perimeter of the figure in terms of w.



22. Shanti baked $5p$ croissants. Jon baked twice as many croissants as Shanti. Ching baked 16 fewer croissants than Jon. Find the total number of croissants they baked in terms of p.

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23. Bryan had \$20x. He spent \$3x for breakfast, \$5 for maps, and \$6x for a guide book. Find the amount of money Bryan had left in terms of x.

24. Kelly leaves her home and cycles $4y$ miles south, then cycles $(3y + 9)$ miles east. Finally, she cycles $(5y + 7)$ miles south and reaches her school. How far does Kelly cycle?

25. A square has sides $\frac{5s - 2}{4}$ yards long. A rectangle is $(s + 9)$ yards long and $(3s - 5)$ yards wide.

a) Find the perimeter of the square.

b) Find the perimeter of the rectangle.

c) Find the sum of the perimeters of the two figures if $s = 5$.

d) The perimeter of the rectangle is greater than the perimeter of the square. Find the difference between the perimeters of the two figures if $s = 7$.

Chapter 7

Lesson 7.1

1. $k + 8$ **2.** $10 - y$

3. $7g$ **4.** $\frac{h}{8}$ or $\frac{1}{8}h$

5. $5w - 6$ **6.** $7z + 10$

7. $4h - 10$ **8.** $\frac{s}{9} + 5$ or $5 + \frac{s}{9}$

9. $\frac{6y}{7}$

10. $4 \times 4 - \frac{h}{3}$ or $16 - \frac{h}{3}$

11. **a)** $(p - 10)$ stickers
b) $3p$ stickers
c) $(p + 6)$ stickers
d) $\frac{2p}{5}$ stickers

12. $(6g + 10)$ seashells

13. $(2b - 6)$ dollars

14. $\frac{50}{x + 2}$ loaves of bread

15. 3 units $\rightarrow 12y$
1 unit $\rightarrow 12y \div 3 = 4y$
5 units $\rightarrow 5 \times 4y = 20y$
$20y$ silver guppies

16. $(\frac{4p}{3} - 5)$ years old

17. $(y^2 + 2y)$ square centimeters

Lesson 7.2

1. $6 \cdot 5 + 7 = 37$

2. $9 \cdot 3 - 10 = 17$

3. $14 \cdot 7 - 98 + 3 \cdot 7 = 21$

4. $6 \cdot 8 + 25 - 5 \cdot 8 \div 4 = 63$

5. $50 - \frac{7 \cdot 6}{3} + 4 \cdot 6 = 60$

6. $10 \cdot 10 - \frac{3 \cdot 10 - 2}{4} + 5 = 98$

7. $3(5 \cdot 4 - 1) - 4(3 \cdot 4 - 7) = 37$

8. $3(5 \cdot 4 - 6) + 4(20 - 3 \cdot 4) = 74$

9. $5(10 \cdot 9 + 3) - 7 \cdot 9 = 402$

10. $4(5 \cdot 9 - 3) - 2(6 \cdot 9 - 7) = 74$

11. $\frac{6 \cdot 4 + 4}{7} + \frac{5 \cdot 4 - 6}{2} - \frac{3 \cdot 4}{4} = 8$

12. $\frac{3(6 - 2)}{4} + \frac{4(2 \cdot 6 - 3)}{5} = 10\frac{1}{5}$

13. $8e + 20 - 60 = 8 \cdot 7 + 20 - 60$
$= 16$

14. $(2 \cdot 4 + 1)(3 \cdot 4 - 6) = 54$

15. $5(3w + 2) - 3(w^2 - 5w + 4)$
$= 5(3 \cdot 6 + 2) - 3(6 \cdot 6 - 5 \cdot 6 + 4)$
$= 5 \cdot 20 - 3 \cdot 10 = 70$

16. $2(3 \cdot 9 + 8) + 5(40 - 4 \cdot 9) = 90$

17. $\frac{3}{4}(12 + 4) + \frac{5}{6}(12 - 6)$
$= 12 + 5 = 17$

18. $(5x + 1) \div (2x - 5)$
$= (5 \cdot 7 + 1) \div (2 \cdot 7 - 5) = 4$

19. $\frac{5 + 3}{5 - 1} + \frac{4 \cdot 5 - 5}{2 \cdot 5 + 5} - \frac{6 \cdot 5 - 25}{5} = 2$

Lesson 7.3

1. $2x + 7$, coefficient 2

2. $k - 3$, coefficient 1

3. $10g$ **4.** $3u$

5. $11m$ **6.** $16x$

7. equivalent **8.** not equivalent

9. not equivalent **10.** equivalent

11. $4 + 3d$ **12.** $8 + 10k$

13. $6m + 5$ **14.** $9 + n$

15. u **16.** $12 + 5k$

17. $5x + 7$ **18.** $7r + 4$

19. $5x + 5x + 3x + 3x + 3x = 19x$
$19x$ dollars

20. $3z + 3z + 3z + 3z + 3z + 4z - 7$
$= 19z - 7$
$(19z - 7)$ hours

21. $30w$ centimeters

22. Shanti: $5p$
Jon: $10p$
Ching: $10p - 16$
Total $= 25p - 16$
$(25p - 16)$ croissants

23. $20x - 3x - 5 - 6x = 11x - 5$
$(11x - 5)$ dollars

24. $4y + 3y + 9 + 5y + 7 = 12y + 16$
$(12y + 16)$ miles

25. **a)** $4\left(\frac{5s - 2}{4}\right) = 5s - 2$
$(5s - 2)$ yards
b) $2(s + 9) + 2(3s - 5)$
$= 2s + 18 + 6s - 10$
$= 8s + 8$
$(8s + 8)$ yards
c) $(5s - 2) + (8s + 8)$
$= 13s + 6$
$13 \cdot 5 + 6 = 71$
71 yards
d) $(8s + 8) - (5s - 2) = 3s + 10$
$3 \cdot 7 + 10 = 31$
31 yards

Lesson 7.4

1. $12w + 15$ **2.** $30 - 15y$

3. $14a - 49$ **4.** $27p + 45$

5. $30 - 40d$ **6.** $40r + 24$

7. $7(y + 3)$ **8.** $4(3 - k)$

9. $6(3 - 2h)$ **10.** $5(4w + 3)$

11. $2(7 - 4x)$ **12.** $3(8p - 5)$

13. not equivalent **14.** equivalent

15. equivalent **16.** not equivalent

17. $29x + 13$ **18.** $5k + 46$

19. $76w + 17$ **20.** $45 + 13g$