



ADA MERRITT K-8 CENTER

7TH GRADE MATHEMATICS SUMMER STUDY PACKET

THE FOLLOWING STUDY GUIDE INCLUDES MATHEMATICS CONTENT THAT IS A PRE-REQUISITE FOR NEXT SCHOOL YEAR. YOU WILL RECEIVE CREDIT FOR THE COMPLETION OF THE PACKET SO MAKE SURE TO ATTACH ALL OF THE WORK NECESSARY TO ANSWER EACH PROBLEM.

STUDENT NAME: _____

1-3**Study Guide and Intervention****Order of Operations**

Use the **order of operations** to evaluate numerical expressions.

1. Do all operations within grouping symbols first.
2. Evaluate all powers before other operations.
3. Multiply and divide in order from left to right.
4. Add and subtract in order from left to right.

EXAMPLE 1 Evaluate $(10 - 2) - 4 \cdot 2$.

$$\begin{aligned} (10 - 2) - 4 \cdot 2 &= 8 - 4 \cdot 2 && \text{Subtract first since } 10 - 2 \text{ is in parentheses.} \\ &= 8 - 8 && \text{Multiply 4 and 2.} \\ &= 0 && \text{Subtract 8 from 8.} \end{aligned}$$

EXAMPLE 2 Evaluate $8 + (1 + 5)^2 \div 4$.

$$\begin{aligned} 8 + (1 + 5)^2 \div 4 &= 8 + 6^2 \div 4 && \text{First, add 1 and 5 inside the parentheses.} \\ &= 8 + 36 \div 4 && \text{Find the value of } 6^2. \\ &= 8 + 9 && \text{Divide 36 by 4.} \\ &= 17 && \text{Add 8 and 9.} \end{aligned}$$

EXERCISES

Evaluate each expression.

1. $(1 + 7) \times 3$

2. $28 - 4 \cdot 7$

3. $5 + 4 \cdot 3$

4. $(40 \div 5) - 7 + 2$

5. $35 \div 7(2)$

6. 3×10^3

7. $45 \div 5 + 36 \div 4$

8. $42 \div 6 \times 2 - 9$

9. $2 \times 8 - 3^2 + 2$

10. $5 \times 2^2 + 32 \div 8$

11. $3 \times 6 - (9 - 8)^3$

12. 3.5×10^2

1-3**Practice: Skills****Order of Operations**

Evaluate each expression.

1. $9 - 3 + 4$

2. $8 + 6 - 5$

3. $12 \div 4 + 5$

4. $25 \times 2 - 7$

5. $36 \div 9(2)$

6. $6 + 3(7 - 2)$

7. $3 \times 6.2 + 5^2$

8. $(1 + 11)^2 \div 3$

9. $12 - (2 + 8)$

10. $15 - 24 \div 4 \cdot 2$

11. $(4 + 2) \cdot (7 + 4)$

12. $(3 \cdot 18) \div (2 \cdot 9)$

13. $24 \div 6 + 4^2$

14. $3 \times 8 - (9 - 7)^3$

15. $9 + (9 - 8 + 3)^4$

16. $3 \times 2^2 + 24 \div 8$

17. $(15 \div 3)^2 + 9 \div 3$

18. $(52 \div 4) + 5^3$

19. 26×10^3

20. 7.2×10^2

21. $5 \times 4^2 - 3 \times 2$

22. $24 \div 6 \div 2$

23. $13 - (6 - 5)^5$

24. $(8 - 3 \times 2) \times 6$

25. $(11 \cdot 4 - 10) \div 2$

26. $10 \div 2 \times (4 - 3)$

27. 1.82×10^5

28. $35 \div 7 \times 2 - 4$

29. $2^5 + 7(9 - 1)$

30. $12 + 16 \div (3 + 1)$

1-4**Study Guide and Intervention****Algebra: Variables and Expressions**

To evaluate an algebraic expression you replace each variable with its numerical value, then use the order of operations to simplify.

EXAMPLE 1 Evaluate $6x - 7$ if $x = 8$.

$$\begin{aligned} 6x - 7 &= 6(8) - 7 && \text{Replace } x \text{ with } 8. \\ &= 48 - 7 && \text{Use the order of operations.} \\ &= 41 && \text{Subtract } 7 \text{ from } 48. \end{aligned}$$

EXAMPLE 2 Evaluate $5m - 3n$ if $m = 6$ and $n = 5$.

$$\begin{aligned} 5m - 3n &= 5(6) - 3(5) && \text{Replace } m \text{ with } 6 \text{ and } n \text{ with } 5. \\ &= 30 - 15 && \text{Use the order of operations.} \\ &= 15 && \text{Subtract } 15 \text{ from } 30. \end{aligned}$$

EXAMPLE 3 Evaluate $\frac{ab}{3}$ if $a = 7$ and $b = 6$.

$$\begin{aligned} \frac{ab}{3} &= \frac{(7)(6)}{3} && \text{Replace } a \text{ with } 7 \text{ and } b \text{ with } 6. \\ &= \frac{42}{3} && \text{The fraction bar is like a grouping symbol.} \\ &= 14 && \text{Divide.} \end{aligned}$$

EXAMPLE 4 Evaluate $x^3 + 4$ if $x = 3$.

$$\begin{aligned} x^3 + 4 &= 3^3 + 4 && \text{Replace } x \text{ with } 3. \\ &= 27 + 4 && \text{Use the order of operations.} \\ &= 31 && \text{Add } 27 \text{ and } 4. \end{aligned}$$

EXERCISES

Evaluate each expression if $a = 4$, $b = 2$, and $c = 7$.

1. $3ac$

2. $5b^3$

3. abc

4. $5 + 6c$

5. $\frac{ab}{8}$

6. $2a - 3b$

7. $\frac{b^4}{4}$

8. $c - a$

9. $20 - bc$

10. $2bc$

11. $ac - 3b$

12. $6a^2$

13. $7c$

14. $6a - b$

15. $ab - c$

1-4**Practice: Skills****Algebra: Variables and Expressions**Evaluate each expression if $w = 2$, $x = 3$, $y = 5$, and $z = 6$.

1. $2w$

2. $y + 5$

3. $9 - z$

4. $x + w$

5. $3 + 4z$

6. $6y - 5$

7. y^2

8. $y - x$

9. $\frac{z}{2}$

Evaluate each expression if $m = 3$, $n = 7$, and $p = 9$.

10. $m + n$

11. $12 - 3m$

12. $5p$

13. $3.3p$

14. $3.3p + 2$

15. $2p + 3.3$

16. $20 + 2n$

17. $20 - 2n$

18. $\frac{n}{7}$

19. n^2

20. $6m^2$

21. $\frac{p^2}{3}$

22. $1.1 + n$

23. $p - 8.1$

24. $3.6m$

25. $3n - 2m$

26. $3m - n$

27. $2.1n + p$

28. $\frac{m^2}{p}$

29. $\frac{2.5m + 2.5}{5}$

30. $\frac{(n + 2)^2}{3}$

1-6**Study Guide and Intervention****Algebra: Properties**

Property	Arithmetic	Algebra
Distributive Property	$5(3 + 4) = 5(3) + 5(4)$	$a(b + c) = a(b) + a(c)$
Commutative Property of Addition	$5 + 3 = 3 + 5$	$a + b = b + a$
Commutative Property of Multiplication	$5 \times 3 = 3 \times 5$	$a \times b = b \times a$
Associative Property of Addition	$(2 + 3) + 4 = 2 + (3 + 4)$	$(a + b) + c = a + (b + c)$
Associative Property of Multiplication	$(4 \times 5) \times 6 = 4 \times (5 \times 6)$	$(a \times b) \times c = a \times (b \times c)$
Identity Property of Addition	$5 + 0 = 5$	$a + 0 = a$
Identity Property of Multiplication	$5 \times 1 = 5$	$a \times 1 = a$

EXAMPLE 1 Use the Distributive Property to write $6(4 + 3)$ as an equivalent expression. Then evaluate the expression.

$$\begin{aligned} 6(4 + 3) &= 6 \cdot 4 + 6 \cdot 3 && \text{Apply the Distributive Property.} \\ &= 24 + 18 && \text{Multiply.} \\ &= 42 && \text{Add.} \end{aligned}$$

EXAMPLE 2 Name the property shown by each statement.

$$5 \times 4 = 4 \times 5 \quad \text{Commutative Property of Multiplication}$$

$$12 + 0 = 12 \quad \text{Identity Property of Addition}$$

$$7 + (6 + 3) = (7 + 6) + 3 \quad \text{Associative Property of Addition}$$

EXERCISES

Use the Distributive Property to write each expression as an equivalent expression. Then evaluate the expression.

1. $5(7 + 2)$

2. $4(9 + 1)$

3. $2(6 + 7)$

Name the property shown by each statement.

4. $9 \times 1 = 9$

5. $7 \times 3 = 3 \times 7$

6. $(7 + 8) + 2 = 7 + (8 + 2)$

7. $6(3 + 2) = 6(3) + 6(2)$

8. $15 + 12 = 12 + 15$

9. $1 \times 20 = 20$

10. $(9 \times 5) \times 2 = 9 \times (5 \times 2)$

11. $3 = 0 + 3$

Using Addition to Solve Equations**Solve:** $k - 18.36 = 47.51$.**Step 1** Write the equation.

$$k - 18.36 = 47.51$$

Step 2 The equation shows subtraction. Use addition to solve. Add 18.36 to both sides of the equation. You want to get k by itself.

$$k - 18.36 + 18.36 = 47.51 + 18.36$$

Step 3 Show the solution.

$$k = 65.87$$

Practice • Solve the equations.

1. $m - 6 = 32$

2. $k - 53 = 24$

3. $z - 40 = 35$

4. $w - 17 = 67$

5. $r - 9.6 = 12.5$

6. $t - 5.7 = 5.7$

7. $s - 4\frac{1}{2} = 8\frac{1}{6}$

8. $n - 3\frac{2}{3} = 2\frac{1}{6}$

Mixed Practice • Solve the equations. Check your answers.

9. $g - 15 = 53$

10. $r - 47 = 38$

11. $t - 40 = 21$

12. $p - 38 = 16$

13. $h - 4.5 = 9.6$

14. $s - 4.9 = 1.2$

15. $f - 16.4 = 43.2$

16. $x + 4.7 = 12.9$

17. $w - 7.26 = 10.53$

18. $q - 2.61 = 13.49$

19. $c - 4.13 = 7.85$

20. $b - 45.83 = 10.29$

21. $f + 5\frac{1}{4} = 9\frac{1}{2}$

22. $v - 4\frac{1}{4} = 1$

23. $m - 9\frac{3}{8} = 5\frac{1}{4}$

24. $w - 2\frac{1}{6} = 5\frac{1}{3}$

Use addition or subtraction to solve the equations. Check your answers.

25. $n + 14 = 23$

26. $p - 17 = 37$

27. $a + 16 = 38$

28. $d - 58 = 14$

29. $r + 1.4 = 8.4$

30. $u - 21.3 = 8.4$

31. $j + 8.6 = 13.3$

32. $i - 6.18 = 24.12$

Write equations. Then solve.

33. A number decreased by 27 is 50. _____

34. A number less 30 is 48. _____

Using Subtraction to Solve EquationsSolve: $x + 7 = 13$.

Step 1 Write the equation.

$$x + 7 = 13$$

Step 2 Subtract 7 from both sides of the equation.
You want to get x by itself.

Step 3 Show the solution.

$$x + 7 - 7 = 13 - 7$$

$$x = 6$$

Practice • Solve the equations.

1. $s + 36 = 89$

2. $q + 19 = 45$

3. $n + 29 = 55$

4. $y + 47 = 99$

5. $j + 1.9 = 9.7$

6. $f + 2.7 = 3.5$

7. $k + 3\frac{1}{3} = 5\frac{5}{6}$

8. $d + 5\frac{1}{5} = 8$

9. $g + 13 = 25$

10. $i + 54 = 75$

11. $p + 89 = 129$

12. $r + 23 = 85$

13. $t + 56 = 89$

14. $h + 49 = 91$

15. $u + 26 = 73$

16. $a + 115 = 247$

17. $b + 3.4 = 7.2$

18. $c + 4.5 = 9.8$

19. $j + 6.2 = 8.7$

20. $v + 5.9 = 6.8$

21. $n + 32.6 = 57.2$

22. $a + 65.8 = 71.4$

23. $d + 92.3 = 132.8$

24. $m + 7.97 = 12.28$

25. $h + 3\frac{1}{8} = 6\frac{5}{8}$

26. $2\frac{1}{3} + c = 7\frac{2}{3}$

27. $8\frac{3}{4} = 5\frac{1}{2} + x$

28. $a + 4\frac{2}{3} = 6\frac{1}{6}$

Write the equations. Then solve.

29. 7 more than a number is 63. _____

30. A number increased by 18 is 41. _____

Use with text pages 122–123.

Using Multiplication to Solve Equations

Solve: $\frac{n}{6} = 9$.

Step 1 Note that the equation shows division.

$$\frac{n}{6} = 9$$

Step 2 Use multiplication to solve.
Multiply both sides of the equation by 6.
You want to get n by itself.

$$6 \times \frac{n}{6} = 6 \times 9$$

Step 3 Show the solution.

$$n = 54$$

Practice • Solve the equations.

1. $\frac{w}{3} = 8$

2. $\frac{n}{7} = 9$

3. $\frac{x}{10} = 17$

4. $\frac{b}{9} = 24$

5. $\frac{y}{0.8} = 2.9$

6. $\frac{k}{6} = 4.2$

7. $\frac{d}{4} = 37$

8. $\frac{c}{17} = 4$

9. $\frac{g}{5.6} = 8$

10. $\frac{m}{45} = 3$

11. $\frac{r}{27} = 2$

12. $\frac{p}{38} = 9$

13. $\frac{n}{0.47} = 22$

14. $\frac{i}{17} = 10$

15. $\frac{y}{1.4} = 35$

16. $\frac{h}{31} = 24$

Mixed Practice • Solve the equations.

17. $3r = 66$

18. $\frac{1}{9}x = 16$

19. $4n = 5.2$

20. $\frac{r}{2.8} = 5.6$

21. $\frac{1}{6}m = 36$

22. $k + 5 = 38$

23. $0.9t = 9$

24. $8m = 136$

Problem Solving • Applications

Write the equations. Then solve.

25. A number divided by 8 is 56. _____

26. A number divided by 14 is 23. _____

Using Division to Solve Equations*Solve:* $8n = 72$.

Step 1 Write the equation.

$8n = 72$

Step 2 Divide both sides of the equation by 8. You want to get n by itself.

$$\frac{8n}{8} = \frac{72}{8}$$

Step 3 Show the solution.

$n = 9$

Practice • Solve the equations.

1. $7n = 56$

2. $2x = 94$

3. $6q = 312$

4. $2.7r = 8.1$

5. $1.8k = 7.2$

6. $0.6m = 30$

7. $0.7j = 0.42$

8. $4.5y = 18$

9. $3t = 108$

10. $7y = 609$

11. $9b = 684$

12. $8r = 5.20$

13. $5s = 615$

14. $0.4a = 9.44$

15. $2c = 51.6$

16. $7k = 602$

17. $43e = 1,376$

18. $52f = 468$

19. $9.1h = 3.64$

20. $87p = 1,218$

21. $63d = 378$

22. $24q = 552$

23. $35u = 2,240$

24. $48m = 3,504$

Problem Solving • Applications

Write equations. Then solve.

25. 6 times a number is 72. _____

26. 9 times a number is 135. _____

27. 7 times a number is 9.8. _____

Use with text pages 130–131.