

ALGEBRA

Week One

Review of Chapters 1 and 2: Algebra: Arithmetic with Letters, The Rule of Arithmetic.

California Core Standard – Algebra - A1 SI-D: Interpreting Categorical and Quantitative Data

Summarize, represent, and interpret data on a single count or measurement variable. 1.

Represent data with plots on the real number line (dot plots, histograms, and box plots). ↔ 2.

Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

↔ 3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). ↔

Objectives: Chapter 1 – To recognize numerical and algebraic expressions, understands the use of variables in algebraic expressions. Chapter 2 – recognize the commutative property of addition and multiplication; understand the associative property of addition and multiplication.

Monday Page 1 #s 1-30

Tuesday Page 3 #s 1-24

Wednesday Page 5 #s 1-18

Thursday Page 7 #s 1-10

Friday Page 9 #s 1-30

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Week Two

Review of Chapters 3 and 4: Linear Equations with one variable, and Applications of Algebra.

California Core Standard – Algebra - A1 SI-D: Interpreting Categorical and Quantitative Data

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Objectives: Chapter 3 – write and solve equations, use formulas for perimeter and area to solve problems. Chapter 4 – Write and algebraic equation for number sentence, identify formulas to use in specific types of problems.

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Tuesday Page 13 #s 1-15

Wednesday Page 15 #s 1-10

Thursday Page 17 #s 1-25

Friday Page 19 #s 1-24

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Week Three

Review of Chapters 5 and 6: Triangles and Right Triangles.

California Core Standard – Algebra - A1 SI-D: Interpreting Categorical and Quantitative Data

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↔ 3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). ↔

Objectives: Chapter 5 – recognize and use exponents in computations, identify the benefit of using scientific notation in some calculations. Chapter 6 – completely factors integers, find greatest common factor of polynomial, factor trinomial.

Monday Page 21 #s 1-18

Tuesday Page 23 #s 1-15

Wednesday Page 25 #s 1-10

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Friday Page 29 # 1-10

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Week Four

Review of Chapters 7 and 8: Data, Statistics, and Probabilities, and Fractions and Algebra.

California Core Standard – Algebra - A1 SI-D: Interpreting Categorical and Quantitative Data

Summarize, represent, and interpret data on a single count or measurement variable. 1. Represent data with plots on the real number line (dot plots, histograms, and box plots). ↔ 2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. ↔ 3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). ↔

Objectives: Chapter 7 – organizes data into graphs, read and interpret graphic representations. Chapter 8 – write fractions in their simplest form, find the greatest common factor, multiply and divide algebraic fractions.

Monday Page 31 #s 1-5

Tuesday Page 33 #s 1-5

Wednesday Page 35 #s 1-10

Thursday Complete any unfinished assignments

Friday Complete any unfinished assignments

Arithmetic and Algebra

EXAMPLE

$16 + 2 = 22$ *false*

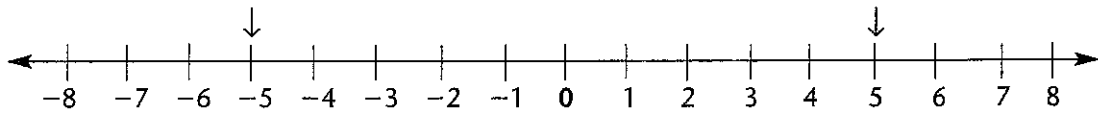
$10 \div 5 = 2$ *true*

$33 - n = 12$ *open*

Directions Write *true* if the statement is true or *false* if it is false. Write *open* if the statement is neither true nor false.

- | | | | |
|------------------------|-------|------------------------|-------|
| 1. $11 + 5 = 16$ | _____ | 16. $50 - 5 = 45$ | _____ |
| 2. $11 + 3 = 16$ | _____ | 17. $\frac{18}{3} = 6$ | _____ |
| 3. $7 - 7 = 0$ | _____ | 18. $30 + 30 = 60$ | _____ |
| 4. $6 \cdot 6 = 36$ | _____ | 19. $22n = 44$ | _____ |
| 5. $12 + n = 17$ | _____ | 20. $27 \div 9 = 3$ | _____ |
| 6. $32 \div 8 = 4$ | _____ | 21. $27 - 9 = 18$ | _____ |
| 7. $2 \cdot 3 = 5$ | _____ | 22. $6 \cdot 6 = 38$ | _____ |
| 8. $\frac{22}{11} = 3$ | _____ | 23. $11 + n = 35$ | _____ |
| 9. $100 + 10 = 120$ | _____ | 24. $15 \div 3 = 4$ | _____ |
| 10. $7n = 49$ | _____ | 25. $18 \div 9 = 2$ | _____ |
| 11. $7 \cdot 7 = 49$ | _____ | 26. $8n = 112$ | _____ |
| 12. $37 - n = 12$ | _____ | 27. $4 \cdot 4 = 8$ | _____ |
| 13. $\frac{n}{2} = 6$ | _____ | 28. $14 - n = 1$ | _____ |
| 14. $60 - 60 = 10$ | _____ | 29. $\frac{6}{2} = 3$ | _____ |
| 15. $17 \cdot 1 = 18$ | _____ | 30. $7 + 27 = 35$ | _____ |

Integers on the Number Line

EXAMPLE


- All the numbers on this number line are examples of *integers*.
- An example of a *negative integer* is -5 (see arrow).
- An example of a *positive integer* is 5 (see arrow).
- The number 0 is neither negative nor positive.
- $|-5| = 5$. In other words, -5 is 5 units from 0 (count the units).
- $|5| = 5$. In other words, 5 is 5 units from 0 (count the units).

Directions Identify each integer as either *negative*, *positive*, or *zero*.

- | | | | | | |
|---------|-------|----------|-------|----------|-------|
| 1. 6 | _____ | 5. 8 | _____ | 9. 20 | _____ |
| 2. 13 | _____ | 6. -9 | _____ | 10. 1 | _____ |
| 3. -2 | _____ | 7. 0 | _____ | 11. 7 | _____ |
| 4. 11 | _____ | 8. -33 | _____ | 12. -1 | _____ |

Directions Write each absolute value.

- | | | | | | |
|------------|-------|-------------|-------|------------|-------|
| 13. $ -5 $ | _____ | 17. $ +18 $ | _____ | 21. $ 12 $ | _____ |
| 14. $ 6 $ | _____ | 18. $ 5 $ | _____ | 22. $ 4 $ | _____ |
| 15. $ -2 $ | _____ | 19. $ -11 $ | _____ | 23. $ -9 $ | _____ |
| 16. $ 2 $ | _____ | 20. $ -12 $ | _____ | 24. $ 9 $ | _____ |

Directions Solve this problem.

25. On the number line, how could you represent \$5 that you earned?
How could you represent \$5 that you had to pay? _____

Subtracting Integers

EXAMPLEFind the difference: $14 - (-15)$ **Rule** To subtract in algebra, add the opposite.15 is the opposite of -15 .

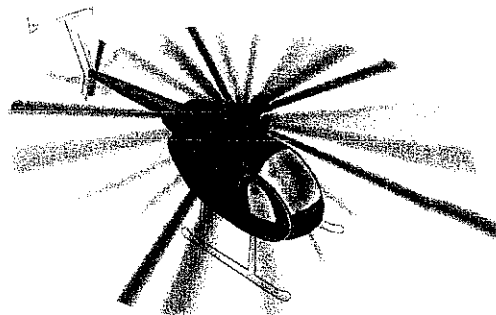
$$14 + 15 = 29$$

Directions Rewrite each expression as addition. Solve the new expression.

- | | | | |
|-----------------|-------|-----------------|-------|
| 1. $-4 - (-11)$ | _____ | 10. $-5 - (-5)$ | _____ |
| 2. $9 - (+3)$ | _____ | 11. $2 - (+9)$ | _____ |
| 3. $-1 - 13$ | _____ | 12. $1 - (+4)$ | _____ |
| 4. $-6 - (+10)$ | _____ | 13. $6 - 8$ | _____ |
| 5. $7 - (-10)$ | _____ | 14. $-8 - (-3)$ | _____ |
| 6. $4 - (+4)$ | _____ | 15. $-3 - (+7)$ | _____ |
| 7. $2 - (+8)$ | _____ | 16. $8 - (-7)$ | _____ |
| 8. $-11 - (-1)$ | _____ | 17. $10 - (+5)$ | _____ |
| 9. $6 - (+2)$ | _____ | 18. $5 - 6$ | _____ |

Directions Solve these problems. Write an expression and the answer.

19. Dara's kite is flying 67 feet high. Jill's is flying 40 feet high. What is the difference between the heights of these two kites?
- _____
20. A helicopter hovers 60 m above the ocean's surface. A submarine is resting 30 m underwater, directly below the helicopter. What is the difference between the positions of these two objects?
- _____



Integers

Data from a climbing expedition is shown in this table.

Elevation in Feet (Compared to Sea Level)	
Base Camp	-384
Camp 1	+5,027
Camp 2	+7,511
Camp 3	+8,860
Camp 4	+10,103
Camp 5	+10,856
Camp 6	+11,349
Summit	+12,015

During the climb, some climbers began at base camp and climbed to the summit. Other climbers also began at base camp but did not reach the summit—these climbers moved back and forth between camps carrying supplies and other necessities.

Directions The movements of various climbers in the expedition are shown below. Find the number of feet climbed by each climber.

1. Climber A: Base Camp to Camp 1 to Base Camp _____
2. Climber C: Base Camp to Camp 5 to Base Camp _____
3. Climber F: Base Camp to Camp 3 to Base Camp _____
4. Climber B: Base Camp to Camp 2 to Base Camp _____
5. Climber H: Base Camp to Camp 6 to Base Camp _____
6. Climber E: Base Camp to Summit to Base Camp _____
7. Climber G: Base Camp to Camp 4 to Base Camp _____
8. Climber D: Base Camp to Camp 5 to Camp 3
to Camp 4 to Base Camp _____
9. Climber I: Base Camp to Camp 2 to Camp 1
to Camp 6 to Base Camp _____
10. How many feet above base camp is the summit? _____

Simplifying Expressions—One Variable

EXAMPLESimplify $2n + 2 + 4n$.

1. Look for like terms. $2n$ and $4n$ are like terms, because they have the same variable, n .
2. Combine the terms: $2n + 4n = 6n$
3. Rewrite the whole expression: $6n + 2$

Now you are finished, because $6n$ cannot combine with 2.**Directions** In each expression, underline the like terms.

1. $3k - 8 + 2k$

6. $-2 + 11c + c$

2. $p + 12 + p$

7. $\frac{4}{7} + 2m + 3m$

3. $100 + 4w + 4w$

8. $2y - (-3y) + 7$

4. $5m - 3 + 2m$

9. $4x - 13 + 5x$

5. $7x + 5x - 12$

10. $8r + (-3r)$

Directions Simplify each expression.

11. $3b + b$ _____

21. $2y + (-2y) + 5$ _____

12. $11y + 2y + y$ _____

22. $-5 + 6n - 4n$ _____

13. $7j + 3j - 2j$ _____

23. $2x + 11x - 13$ _____

14. $2k - 17 + k$ _____

24. $-h + 7h$ _____

15. $11x + x - 14$ _____

25. $-11 - (-3k) + k$ _____

16. $22 + 2d + 8d$ _____

26. $7d - d + 40$ _____

17. $9g + (-2g) + 4$ _____

27. $8 + 3m - (-m)$ _____

18. $14h - 3 - 2h$ _____

28. $3w + (-5w)$ _____

19. $2m + (-8m)$ _____

29. $2 + 5x - 2x$ _____

20. $3 + 4k - 3k$ _____

30. $8g + (-5g) - 6$ _____

Positive Exponents

EXAMPLE To multiply *like* variables having exponents, add the exponents.

$$k^3 \cdot k^3 = k^{(3+3)} = k^6$$

To divide *like* variables having exponents, subtract the exponents.

$$m^4 \div m^2 = m^{(4-2)} = m^2$$

You *cannot* use these rules to multiply or divide unlike variables.

$$y^3 \cdot a^2 \qquad b^5 \div j^2$$

Directions Is the rewritten expression on the right *true* or *false*?
Write the answer.

- $m^4 \cdot m^2 = m^{(4+2)}$ _____
- $a \cdot a \cdot a = a^{(1+1+1)}$ _____
- $k^2 \cdot n^3 = k^{(2+3)}$ _____
- $y^7 \div y = y^{(7-1)}$ _____
- $b^8 \div b^3 = b^{(8-3)}$ _____
- $a \cdot a = 2a$ _____
- $d^6 \div d^2 = d^{(6+2)}$ _____
- $w^2 \cdot w^4 \cdot w^5 = w^{(2+4+5)}$ _____

Directions Simplify each expression.

- | | |
|--------------------------------|---|
| 9. $k^3 \cdot k^3$ _____ | 13. $d^2 \cdot d^5 \cdot d^7$ _____ |
| 10. $w^5 \div w^2$ _____ | 14. $y^7 \div y$ _____ |
| 11. $j^{14} \div j^{10}$ _____ | 15. $x^2 \cdot x^3 \cdot x^8$ _____ |
| 12. $n^6 \cdot n$ _____ | 16. $a^2 \cdot a^2 \cdot a^4 \cdot a^4$ _____ |

Directions Use a calculator to find the value of each expression.

- | | |
|-------------------------------|--------------------------------|
| 17. x^2 when $x = 17$ _____ | 19. r^5 when $r = 3$ _____ |
| 18. c^5 when $c = 2$ _____ | 20. k^3 when $k = 0.8$ _____ |

Commutative Property of Addition

EXAMPLE

$$2n + 3n = \underline{\hspace{2cm}}$$

Expanded notation:

$$n + n + n + n + n + n = n + n + n + n + n$$

$$2n + 3n = 5n$$

Commutative property of addition:

$$7a + 6a = 6a + 7a$$

Directions Find each sum using expanded notation.

1. $k + 3k$ _____

2. $2r + r$ _____

3. $4y + y$ _____

4. $n + 5n$ _____

Directions Rewrite each sum showing the commutative property of addition.

5. $b + 17$ _____

9. $5m + 3p$ _____

6. $3k + 5$ _____

10. $7q + 6$ _____

7. $x + 5x$ _____

11. $164 + 133$ _____

8. $2.7 + 1.2$ _____

12. $8y + 4y$ _____

Directions Solve these problems.

13. Torri weighs 98 pounds. Carrie weighs 116 pounds. Torri adds her weight to Carrie's weight.

What sum will she get? _____

14. Suppose Carrie adds her weight to Torri's weight. What sum will she get? _____

15. What mathematical property do the sums in problems 13 and 14 illustrate?

Associative Property of Addition

EXAMPLE

$$(13 + 10) + 4 = 13 + (10 + 4)$$

$$(b + c) + d = b + (c + d)$$

Directions Rewrite each expression to show the associative property of addition.

1. $3k + (2k + 5)$ _____

4. $7 + (5 + q)$ _____

2. $(1.3 + 8.1) + 6.6$ _____

5. $(3 + 12n) + 2$ _____

3. $(11x + 10y) + 4$ _____

6. $g + (21 + h)$ _____

Directions Answer the questions.

In a club, 3 members bring all of the sandwiches for a picnic.

- Mike and Lynn arrive together. They have already put together Mike's 3 sandwiches and Lynn's 5 sandwiches.
- Hosea comes a little later with 4 sandwiches.
In all, the club has a total of 12 sandwiches.

7. Write an addition expression that shows the grouping described above.

8. Suppose that Mike had come first, alone, and that Lynn and Hosea had come with their combined sandwiches later. Write an addition expression to represent this grouping.

9. Would the club's total number of sandwiches be the same with either grouping?

10. What mathematical property does this story illustrate?

The Distributive Property—Multiplication

EXAMPLE

$$4(2 + 8) = 4 \cdot 2 + 4 \cdot 8 = 8 + 32 = 40$$

$$5(x + y) = 5 \cdot x + 5 \cdot y = 5x + 5y$$

Directions Fill in the blanks in each rewritten expression.

1. $2(x + y) = 2x + \underline{\hspace{2cm}}y$

9. $2[-q + (-3)] = \underline{\hspace{2cm}} - 6$

2. $4(m + 4) = 4\underline{\hspace{2cm}} + 16$

10. $-4(-3 + n) = \underline{\hspace{2cm}} - 4n$

3. $7(8 + 1) = 56 + \underline{\hspace{2cm}}$

11. $3(-7 + b) = -21 + \underline{\hspace{2cm}}$

4. $5(4 + c) = 20 + \underline{\hspace{2cm}}$

12. $7(d + 2k) = 7d + \underline{\hspace{2cm}}$

5. $-1(p + q) = \underline{\hspace{2cm}} - q$

13. $-4(5 + 1) = \underline{\hspace{2cm}} - 4$

6. $8(a + 1) = 8a + \underline{\hspace{2cm}}$

14. $-11(n + p) = \underline{\hspace{2cm}} - 11p$

7. $-2(-j + k) = \underline{\hspace{2cm}} - 2k$

15. $k(13 + m) = 13k + \underline{\hspace{2cm}}$

8. $-10(40 + 30) = -400 - \underline{\hspace{2cm}}$

16. $b(y + z) = \underline{\hspace{2cm}} + bz$

Directions Rewrite each expression, using the distributive property.
Simplify where possible.

17. $16(2 + 1)$ _____

18. $6(r + z)$ _____

19. $-1(d + k)$ _____

20. $3(11 + w)$ _____

21. $-2(-4 + m)$ _____

22. $8[-a + (-3)]$ _____

23. $-9(x + y)$ _____

24. $7(g + 10)$ _____

25. $-8(-v + 8)$ _____

Properties of Zero

EXAMPLE

Additive Property of Zero:	$4 + 0 = 4$	$-2 + 0 = -2$
Additive Inverse Property:	$-3 + 3 = 0$	$5 + (-5) = 0$
Multiplication Property of Zero:	$0(6) = 0$	$-4(0) = 0$

Directions If the two numbers are additive inverses, write *true*.
Otherwise, write *false*.

- | | |
|-----------------------|-----------------------|
| 1. -12 12 _____ | 4. -75 75 _____ |
| 2. 7 -7 _____ | 5. -8 -8 _____ |
| 3. -5 0 _____ | 6. x -x _____ |

Directions Write each sum.

- | | | |
|-------------------|---------------------|---------------------|
| 7. $9 + 0$ _____ | 10. $k + 0$ _____ | 13. $0 - 37$ _____ |
| 8. $0 + 27$ _____ | 11. $-16 + 0$ _____ | 14. $k^5 + 0$ _____ |
| 9. $0 - 14$ _____ | 12. $0 + m^2$ _____ | 15. $0 - y^2$ _____ |

Directions Write each product.

- | | | |
|-----------------------|----------------------|-------------------------|
| 16. $0(112)$ _____ | 19. $(xy)(0)$ _____ | 22. $(-jk)(0)$ _____ |
| 17. $(-17)(0)$ _____ | 20. $(0)(-9)$ _____ | 23. $n^7 \cdot 0$ _____ |
| 18. $0 \cdot q$ _____ | 21. $(cde)(0)$ _____ | 24. $(0)(ab^3)$ _____ |

Directions Solve the problem.

25. Jenna said to Brett, "I'll give you double the number of marbles you have in your pocket."
Brett replied, "But I don't have *any* marbles in my pocket."
Jenna responded, "So I'll give you double nothing, which is nothing."

How could Jenna say the same thing in a mathematical expression? Underline one.

a. $1 + 2 = 3$

b. $0 + 2 = 2$

c. $2(0) = 0$

Powers and Roots

EXAMPLE

$$3^2 = (3)(3) = 9 \qquad \sqrt{9} = 3$$

$$3^3 = (3)(3)(3) = 27 \qquad \sqrt[3]{27} = 3$$

Directions Fill in the blank in each sentence.

- $(19)(19)(19) = 6,859$, so _____³ = 6,859.
- If $17 \cdot 17 = 289$, then $17^2 = 289$ and $\sqrt{289} =$ _____.
- If $\sqrt[3]{216} = 6$, then 6 _____ = 216.
- If $2 \cdot 2 \cdot 2 \cdot 2 = 16$, then the fourth _____ of 16 is 2.
- $(4)(4)(4)(4)(4) = 1,024$, so 4 _____ = 1,024.
- $11^2 = 121$, which means that $11 \cdot$ _____ = 121.

Directions Find each square root. You may use a calculator.

- | | | |
|------------------------|--------------------------|---------------------------|
| 7. $\sqrt{49}$ _____ | 11. $\sqrt{729}$ _____ | 15. $\sqrt{10.24}$ _____ |
| 8. $\sqrt{81}$ _____ | 12. $\sqrt{4}$ _____ | 16. $\sqrt{100}$ _____ |
| 9. $\sqrt{16}$ _____ | 13. $\sqrt{5,929}$ _____ | 17. $\sqrt{182.25}$ _____ |
| 10. $\sqrt{225}$ _____ | 14. $\sqrt{3.61}$ _____ | 18. $\sqrt{36}$ _____ |

Directions Solve the problems.

- Talia is sewing a quilt with a regular checkerboard pattern—that is, all the squares are identical. In each square of the checkerboard, she plans to stitch a simple flower. Talia will have to stitch 36 flowers in all. How many squares lie along one side of the quilt?

- The volume of a cube of sugar is 2.197 cm^3 . Circle the letter of the expression that gives the length of one edge of the cube.
a. $\sqrt[3]{2.197}$ b. $(1.3)^3$ c. $\sqrt{2.197}$

Order of Operations

EXAMPLE

$$2^3 + 12 \cdot 8 =$$

Step 1 Calculate the cube, or third power, of 2: $2^3 = 8$

Step 2 Multiply: $12 \cdot 8 = 96$

Step 3 Add: $8 + 96 = 104$

Directions Find the value using the order of operations.

1. $11 - 2 \cdot 3$ _____

5. $2 + 2^3$ _____

9. $2^2 + 3^2 + 2^4$ _____

2. $2 + 8 \cdot 7$ _____

6. $3 + 27 \div 9$ _____

10. $(7 \cdot 7 - 4) \div 15$ _____

3. $(2 + 8)7$ _____

7. $18 \div 2 + 100$ _____

11. $(6 + 6) \div (59 - 55)$ _____

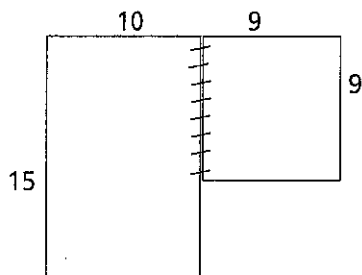
4. $64 - 16 \cdot 4$ _____

8. $2 + 5^2 \cdot 4$ _____

12. $8^2 - 7^2$ _____

Directions Answer the questions to solve the problem.

Mr. and Mrs. Wang plan to knock out a wall between two rooms of their house to make one larger room. One room is a rectangle 10 feet by 15 feet, so its area in square feet is $10(15)$. The other room is a square, 9 feet on a side, so its area is 9^2 square feet. What will be the total area of the new room?



13. Circle the letter of the expression that calculates the answer.

a. $10 + 15 \cdot 9^2$

b. $(10 + 15 + 9)^2$

c. $10 \cdot 15 + 9^2$

14. State the order to perform the operations when calculating the answer.

(1) _____

(2) _____

(3) _____

15. Work out the answer. (You can use a calculator.) _____ square feet

Writing Equations

EXAMPLE

10 times some number equals 30.

$$10x = 30$$

Directions Write an equation for each statement. Let x be the variable in the equation.

- 6 times some number equals 30. _____
- 2 times some number plus 5 equals 9. _____
- 3 times some number minus 8 equals 1. _____
- 17 subtracted from some number equals 14. _____
- 10 times some number plus 7 equals 87. _____
- 11 subtracted from some number equals 2. _____

EXAMPLE

$3x = 18$

$x = 4, 5, 6$

$(3)(4) = 18$ F

$(3)(5) = 18$ F

$(3)(6) = 18$ T

Directions Find the root of each equation by performing the operation on each value for the variable. Write T if the equation is true or F if the equation is false.

7. $5p = 15$

$p = 1$ _____

$p = 2$ _____

$p = 3$ _____

8. $7w = 49$

$w = 5$ _____

$w = 6$ _____

$w = 7$ _____

9. $10k = 80$

$k = 7$ _____

$k = 8$ _____

$k = 9$ _____

10. $2a = 22$

$a = 11$ _____

$a = 12$ _____

$a = 13$ _____

Solving Equations: $x + b = c$

EXAMPLESolve $k + 5 = 9$ for k .**Step 1** Write the equation.

$$k + 5 = 9$$

Step 2 Subtract 5 from both sides of the equation.

$$k + 5 - 5 = 9 - 5$$

Step 3 Simplify.

$$k = 4$$

Step 4 Check.

$$4 + 5 = 9$$

Directions Solve each equation. Check your answer.

1. $w + 3 = 4$ _____

2. $r + 8 = 12$ _____

3. $y + 2 = 7$ _____

4. $c + 1.5 = 4.5$ _____

5. $k + 22 = 60$ _____

6. $d + 9 = 18$ _____

7. $n + 5 = 40$ _____

8. $b + 7 = 14$ _____

9. $x + 32 = 38$ _____

Directions Read the problem and follow the directions.

10. Amy read 17 books over the summer, 11 more than Tim. How many books did Tim read?

Let r stand for the number of books Tim read over the summer:

$$r + 11 = 17$$

How would you solve this equation? Circle the answer.

- Add 11 to both sides.
- Subtract 11 from both sides.
- Subtract 17 from both sides.

Solving Equations with Fractions

EXAMPLESolve $\frac{1}{3}y = 5$ for y .**Step 1** Write the equation.

$$\frac{1}{3}y = 5$$

Step 2 Multiply both sides of the equation by the reciprocal of the fraction.

$$\left(\frac{3}{1}\right)\frac{1}{3}y = \left(\frac{3}{1}\right)5$$

Step 3 Simplify.

$$y = 15$$

Step 4 Check.

$$\frac{1}{3}(15) = 5$$

Directions Solve each equation. Check your answer.

1. $\frac{1}{4}x = 1$ _____

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

3. $\frac{1}{7}q = 2$ _____

4. $\frac{2}{5}r = 6$ _____

5. $\frac{4}{5}m = 20$ _____

6. $\frac{7}{8}k = 42$ _____

7. $\frac{2}{3}d = -10$ _____

8. $\frac{11}{16}y = 33$ _____

9. $\frac{1}{-5}a = -4$ _____

Directions Read the problem and follow the directions.

10. Spruceville received 35 inches of snow last winter, or $\frac{5}{8}$ of its average annual snowfall. What is Spruceville's average annual snowfall?

Let n stand for Spruceville's average annual snowfall:

$$\frac{5}{8}n = 35$$

How would you solve this equation? Circle the answer.

- Subtract 35 and then multiply by $\frac{5}{8}$.
- Multiply both sides by $\frac{8}{5}$.
- Subtract $\frac{5}{8}$ from both sides.

Equations Without Numbers

EXAMPLE

$ax - b = c$

Solve for x .**Step 1** Write the equation.

$2x - 5 = 7$

$ax - b = c$

Step 2 Add 5 or b to both sides.

$2x - 5 + 5 = 7 + 5$

$ax - b + b = c + b$

$2x = 12$

$ax = b + c$

Step 3 Divide each side by 2 or a .

$\frac{2x}{2} = \frac{12}{2}$

$\frac{ax}{a} = \frac{b+c}{a}$

Step 4 Check.

$x = 6$

$x = \frac{b+c}{a}$

$2(6) - 5 = 7$

$a\left(\frac{b+c}{a}\right) - b = c$

$7 = 7$

$(b+c) - b = c$

$c = c$

Directions Solve each equation for x . Check your answer.

1. $ax - c = b$ _____

2. $bc = ax$ _____

3. $x - b + a = c$ _____

4. $abx = -c$ _____

Directions Follow the directions to solve the problem.

5. Center School has won two more soccer games than the combined wins of River School and Bluff School.

This statement can be turned into a mathematical equation.

- Let x stand for the number of games Center School has won.
- Let y stand for the number of games River School has won.
- Let z stand for the number of games Bluff School has won.

$x = y + z + 2$

Solve the equation for z to show the number of soccer games Bluff School has won.

The Pythagorean Theorem

EXAMPLE

Use the Pythagorean theorem: $c^2 = a^2 + b^2$

Find c when $a = 4$ and $b = 5$. Use a calculator, and round the answer to the nearest tenth.

$$c^2 = (4)^2 + (5)^2$$

$$c^2 = 16 + 25$$

$$c^2 = 41$$

$$c = \sqrt{41} = 6.403124 \quad \text{Round off: } 6.4$$

Directions Use the Pythagorean theorem and a calculator to find the missing side of each triangle. Round to the nearest tenth.

1. $a = 2$ $b = 7$ $c = \square$ _____

2. $a = \square$ $b = 6$ $c = 10$ _____

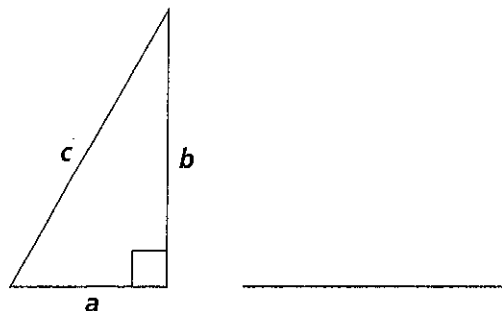
3. $a = \square$ $b = 8$ $c = 14$ _____

4. $a = 9$ $b = \square$ $c = 36$ _____

Directions Solve the problem.

5. A sailboat has a sail in the shape of a right triangle. You know that side a is 2 m long and side b is 4 m long. How long is side c of the sail?

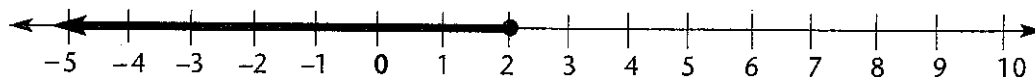
Substitute known values in the Pythagorean theorem and solve. Use your calculator and round to the nearest tenth.



Inequalities on the Number Line

EXAMPLE

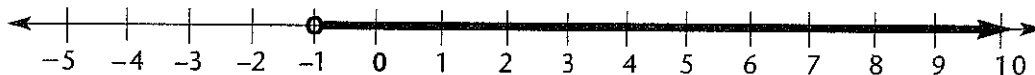
Write a statement of inequality for the number line. Use x as the variable.



$$x \leq 2$$

Directions Write a statement of inequality for each number line. Use x as the variable.

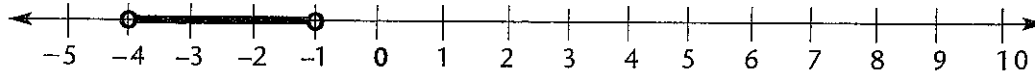
1.



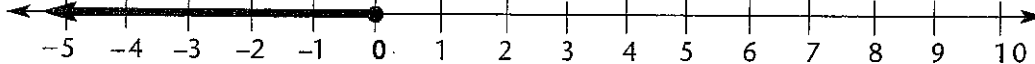
2.



3.



4.



Directions Write T if the disjunction is True or F if it is False.

5. $3 \leq 5$ _____

8. $-1 \geq 1$ _____

6. $8 \geq -3$ _____

9. $0 \geq -5$ _____

7. $2 \geq 4$ _____

10. $-2 \geq -14$ _____