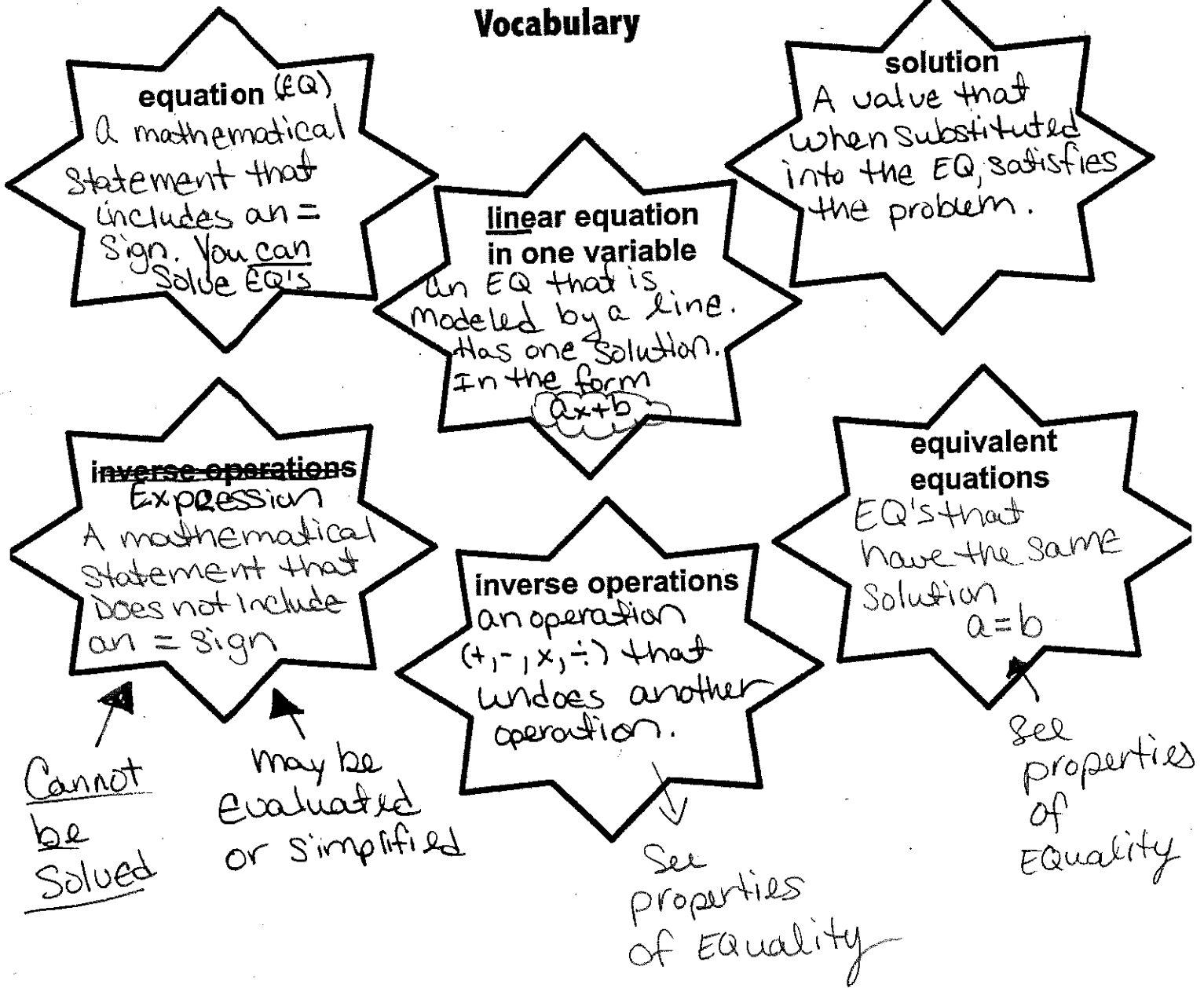


Chapter 1

Solving Linear Equations

1.1 Solving One-Step Equations

Vocabulary



Core Concept: Properties of Equality

Addition Property of equality	Subtraction Property of equality	Multiplication Property of equality	Division Property of equality
If $a=b$, then	If $a=b$, then	If $a=b$, then	If $a=b$, then
$a+c=b+c$	$a-c=b-c$	$a \times c=b \times c$	$a \div c=b \div c$
$x-5=3$ $+5 \quad +5$ $x=8$	$x+5=3$ $-5 \quad -5$ $x=2$	$\frac{1}{3} = 1$ $3 \times \frac{1}{3} = 3 \times 1$ $1 = 3$	$8x = 3$ $\frac{8x}{8} = \frac{3}{8}$ $x = \frac{3}{8}$

1.1: Solving Simple Equations

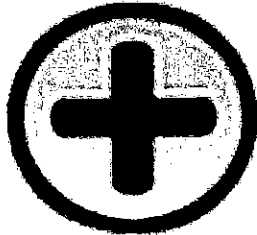
Solve the equation. Check your solution.

<p>1. $w + 4 = 16$</p> $\begin{array}{r} -4 \\ -4 \end{array}$ $\boxed{w = 12}$ <p>✓ $\boxed{12} + 4 = 16$</p> $16 = 16$ <p>yes!</p>	<p>2. $x + 7 = -12$</p> $\begin{array}{r} -7 \\ -7 \end{array}$ $\boxed{x = -19}$ <p>✓ $\boxed{-19} + 7 = -12$</p> $-12 = -12$ <p>yes</p>	<p>3. $-15 + w = 6$</p> $\begin{array}{r} +15 \\ +15 \end{array}$ $\boxed{w = 21}$ <p>✓ $-15 + \boxed{21} = 6$</p> $6 = 6$ <p>yes</p>
<p>4. $z - 5 = 8$</p> $\begin{array}{r} +5 \\ +5 \end{array}$ $\boxed{z = 13}$ <p>✓ $\boxed{13} - 5 = 8$</p> $8 = 8$ <p>yes</p>	<p>5. $-2 = y - 9$</p> $\begin{array}{r} +9 \\ +9 \end{array}$ $\boxed{y = 7}$ <p>✓ $-2 = \boxed{7} - 9$</p> $-2 = -2$ <p>yes</p>	<p>6. $7q = 35$</p> $\begin{array}{r} \div 7 \\ \div 7 \end{array}$ $\boxed{q = 5}$ <p>✓ $7(5) = 35$</p> $35 = 35$ <p>yes</p>
<p>7. $4b = -52$</p> $\begin{array}{r} \div 4 \\ \div 4 \end{array}$ $\boxed{b = -13}$ <p>✓ $4(-13) = -52$</p> $-52 = -52$ <p>yes</p>	<p>8. $3 = \frac{q}{11}$</p> $\begin{array}{r} \cdot 11 \\ \cdot 11 \end{array}$ $\boxed{q = 33}$ <p>✓ $3 = \frac{33}{11}$</p> $3 = 3$ <p>yes</p>	<p>9. $\frac{n}{-2} = -15$</p> $\begin{array}{r} (-2) \cdot \frac{n}{-2} \\ (-2) \cdot \frac{n}{-2} \end{array} = -15(-2)$ $n = 30$ <p>✓ $\frac{30}{-2} = -15$</p> $-15 = -15$ <p>yes</p>

Key Words Used in Math Word Problems

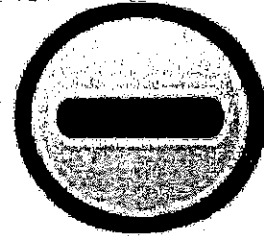
Addition Words

- + add
- + all together or altogether
- + and
- + both
- + combined
- + how many in all
- + how much
- + in all
- + increased by
- + plus
- + sum
- + together
- + total



Subtraction Words

- change
- decreased by
- difference
- fewer or fewer than
- how many are left (or have left)
- how many did not have
- how many (or much) more
- how much longer (shorter, taller, heavier, etc.)
- less or less than
- lost
- minus
- need to
- reduce
- remain
- subtract
- take away



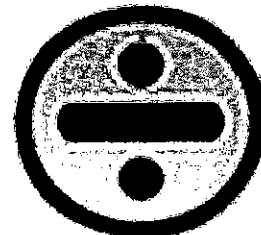
Multiplication Words

- x by (dimension)
- x double
- x each group
- x every
- x factor of
- x increased by
- x multiplied by
- x of
- x product
- x times
- x triple



Division Words

- as much
- cut up
- each group has
- equal sharing
- half (or other fractions)
- how many in each
- parts
- per
- percent
- quotient of
- ratio of
- separated
- share something equally



10. A coupon subtracts \$17.95 from the price p of a pair of headphones. You pay \$71.80 for the headphones after using the coupon. Write and solve an equation to find the original price of the headphones.

$$\begin{array}{r}
 p - 17.95 = 71.80 \\
 + 17.95 \quad + 17.95 \\
 \hline
 p = 89.75
 \end{array}$$

The original price of headphones is \$89.75

11. After a party, you have $\frac{2}{5}$ of the brownies you made left over. There are 16 brownies left. How many brownies did you make for the party? $b = \text{brownies}$

$$\frac{2}{5} \cdot \frac{2}{5} (b) = 16 \cdot \frac{5}{2}$$

$$b = 40 \text{ brownies}$$

You made 40 brownies for the Party

Translate the following into algebraic equations.

12. Two more than a number is ten.

$$2 + n = 10$$

13. Eight less than a number is greater than nine.

$$n - 8 = 9$$

14. The product of two and an number is 22.

$$2n = 22$$

15. The difference of a number and two is seven.

$$n - 2 = 7$$

16. The quotient of a number and three is less than eight.

$$\frac{n}{3} = 8$$

17. Four less than the product of six and a number is nine.

$$6n - 4 = 9$$

Section 1.2
Solving Multi-Step EQ

Solving Multi-step Equations--Six Steps to Solving Equations

1. **Grouping symbol/fraction bar**
2. **Simplify each side of the equation by combining like terms and/or collect the variable on one side of the equation and the constant term on the other.**
3. **Use inverse operations to multiply/divide coefficients**
4. **Use inverse operations to add/subtract constants**
5. **Reduce any fractions**
6. **Check your solution**

1.2: Solving Multi-Step Equations

Solve the equation. Check your solution.

<p>1. $3x + 4 = 19$</p> $\begin{array}{r} -4 \quad -4 \\ \hline 3x = 15 \\ \frac{3}{3} \quad \frac{3}{3} \\ \hline x = 5 \end{array}$ <p style="margin-left: 150px;">$\checkmark 3(5) + 4 = 19$ $\quad \quad \quad 15 + 4 = 19$ $\quad \quad \quad 19 = 19$ $\quad \quad \quad \text{yes}$</p>	<p>2. $5z - 13 = -3$</p> $\begin{array}{r} +13 \quad +13 \\ \hline 5z = 10 \\ \frac{5}{5} \quad \frac{5}{5} \\ \hline z = 2 \end{array}$ <p style="margin-left: 150px;">$\checkmark 5(2) - 13 = -3$ $\quad \quad \quad 10 - 13 = -3$ $\quad \quad \quad -3 = -3$ $\quad \quad \quad \text{yes}$</p>
<p>3. $17 = z - (-9)$</p> $\begin{array}{r} 17 = z + 9 \\ z + 9 = 17 \\ -9 \quad -9 \\ \hline z = 8 \end{array}$ <p style="margin-left: 150px;">$\checkmark 17 = 8 - (-9)$ $\quad \quad \quad 17 = 17$ $\quad \quad \quad \text{yes}$</p>	<p>4. $15 = 2 + 4 - d$</p> $\begin{array}{r} 15 = 6 - d \\ -6 \quad -6 \\ \hline -d = 15 \\ \frac{-1}{-1} \quad \frac{-1}{-1} \\ \hline d = -15 \end{array}$ <p style="margin-left: 150px;">$\checkmark 15 = 2 + 4 - (-9)$ $\quad \quad \quad 15 = 6 + 4$ $\quad \quad \quad 15 = 15$ $\quad \quad \quad \text{yes}$</p>
<p>5. $\frac{f}{4} - 5 = -9$</p> $\begin{array}{r} +5 \quad +5 \\ \hline \frac{f}{4} = -4 \\ \frac{4}{4} \quad \frac{4}{4} \\ \hline f = -16 \end{array}$ <p style="margin-left: 150px;">$\checkmark \frac{-16}{4} - 5 = -9$ $\quad \quad \quad -4 - 5 = -9$ $\quad \quad \quad -9 = -9$ $\quad \quad \quad \text{yes}$</p>	<p>6. $\frac{q + (-5)}{3} = 8$</p> $\begin{array}{r} 3 \cdot \frac{q - 5}{3} = 8 \cdot 3 \\ \hline q - 5 = 24 \\ +5 \quad +5 \\ \hline q = 29 \end{array}$ <p style="margin-left: 150px;">$\checkmark \frac{29 - 5}{3} = 8$ $\quad \quad \quad \frac{24}{3} = 8$ $\quad \quad \quad 8 = 8$ $\quad \quad \quad \text{yes}$</p>
<p>7. $5x + 3x = 28$</p> $\begin{array}{r} 8x = 28 \\ \frac{8}{8} \quad \frac{8}{8} \\ \hline x = \frac{28}{8} \\ \hline x = \frac{7}{2} \end{array}$ <p style="margin-left: 150px;">$\checkmark 8x = 28$ $\quad \quad \quad 8(\frac{7}{2}) = 28$ $\quad \quad \quad 4(7) = 28$ $\quad \quad \quad 28 = 28$</p>	<p>8. $5z - 2z - 4 = -7$</p> $\begin{array}{r} 3z - 4 = -7 \\ +4 \quad +4 \\ \hline 3z = -3 \\ \frac{3}{3} \quad \frac{3}{3} \\ \hline z = -1 \end{array}$ <p style="margin-left: 150px;">$5(-1) - 2(-1) - 4 = -7$ $\quad \quad \quad -5 + 2 - 4 = -7$ $\quad \quad \quad -3 - 4 = -7$ $\quad \quad \quad -7 = -7$ $\quad \quad \quad \text{yes}$</p>
<p>9. $12x + 4 + 2x = 39$</p> $\begin{array}{r} 14x + 4 = 39 \\ 14x = 35 \\ \frac{14}{14} \quad \frac{14}{14} \\ \hline x = \frac{35}{14} \\ \hline x = \frac{5}{2} \end{array}$ <p style="margin-left: 150px;">$12(\frac{5}{2}) + 4 + 2(\frac{5}{2}) = 39$ $\quad \quad \quad 30 + 4 + 5 = 39$ $\quad \quad \quad 39 = 39$</p>	<p>10. $9z - 5 - 4z = -5$</p> $\begin{array}{r} 5z - 5 = -5 \\ +5 \quad +5 \\ \hline 5z = 0 \\ \frac{5}{5} \quad \frac{5}{5} \\ \hline z = 0 \end{array}$ <p style="margin-left: 150px;">$9(0) - 5 - 4(0) = -5$ $\quad \quad \quad -5 = -5$</p>

<p>11. $3(z + 7) = 21$</p> $\begin{array}{r} 3z + 21 = 21 \\ -21 \quad -21 \\ \hline 3z = 0 \\ \frac{3z}{3} = \frac{0}{3} \\ \boxed{z = 0} \end{array}$ $\begin{array}{l} \checkmark 3(0+7) = 21 \\ 3(7) = 21 \\ 21 = 21 \\ \text{yes} \end{array}$	<p>12. $-4(z - 12) = 42$</p> $\begin{array}{r} -4z + 48 = 42 \\ -48 \quad -48 \\ \hline -4z = -6 \\ \frac{-4z}{-4} = \frac{-6}{-4} \\ \boxed{z = \frac{3}{2}} \end{array}$ $\begin{array}{l} \checkmark -4(\frac{3}{2} - 12) = 42 \\ -6 + 48 = 42 \\ 42 = 42 \\ \text{yes} \end{array}$
<p>13. $33 = 12r - 3(9 - r)$</p> $\begin{array}{r} 33 = 12r - 27 + 3r \\ 33 = 15r - 27 \\ +27 \quad +27 \\ \hline 60 = 15r \\ \frac{60}{15} = \frac{15r}{15} \\ \boxed{r = 4} \end{array}$ $\begin{array}{l} \checkmark 33 = 12(4) - 3(9 - 4) \\ 33 = 48 - 3(5) \\ 33 = 48 - 15 \\ 33 = 33 \\ \text{yes} \end{array}$	<p>14. $7 + 3(2g - 6) = -29$</p> $\begin{array}{r} 7 + 6g - 18 = -29 \\ 6g - 11 = -29 \\ +11 \quad +11 \\ \hline 6g = -18 \\ \frac{6g}{6} = \frac{-18}{6} \\ \boxed{g = -3} \end{array}$ $\begin{array}{l} \checkmark 7 + 3(2(-3) - 6) = -29 \\ 7 + 3(-6 - 6) = -29 \\ 7 + 3(-12) = -29 \end{array}$

15. Write and solve an equation to find three consecutive odd integers that have a sum of 63.

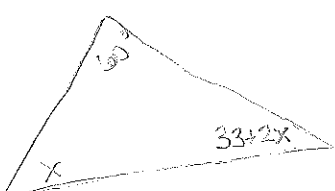
$1^{st} : x$
 $2^{nd} : x + 2$
 $3^{rd} : x + 4$
 $\frac{3x + 6}{3x + 6}$

$$3x + 6 = 63$$

$$\frac{3x}{3} = \frac{57}{3} \rightarrow \boxed{x = 19}$$

19, 21, 23

16. One angle of a triangle has a measure of 60° . The measure of the third angle is 40° more than twice the measure of the second angle. The sum of the angle measures of a triangle is 180° . What is the measure of the second angle? What is the measure of the third angle?



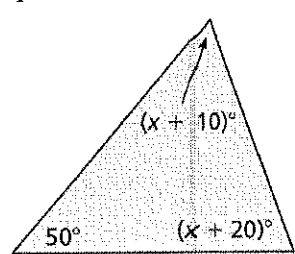
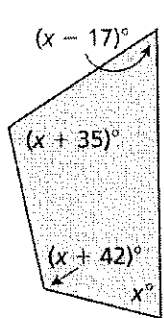
$$93 + 3x = 180$$

$$\frac{3x}{3} = \frac{87}{3}$$

$$x = 29$$

$60^\circ, 29^\circ, 91^\circ$

17. Write and solve an equation to find the value of x . Then find the angle measures of each polygon.

<p>a. The sum S of the angle measures of a quadrilateral is 180°.</p>  $\begin{array}{r} x + 10 \\ x + 20 \\ \hline 50 \\ 2x + 80 = 180 \\ -80 \quad -80 \\ \hline 2x = 100 \\ \frac{2x}{2} = \frac{100}{2} \\ x = 50 \end{array}$ <div style="border: 1px solid black; padding: 5px; display: inline-block;">$50^\circ, 60^\circ, 70^\circ$</div>	<p>b. The sum S of the angle measures of a quadrilateral is 360°.</p>  $\begin{array}{r} x - 17 \\ x + 35 \\ x + 42 \\ x \\ \hline 4x + 60 = 360 \\ -60 \quad -60 \\ \hline 4x = 300 \\ \frac{4x}{4} = \frac{300}{4} \\ x = 75 \end{array}$ <div style="border: 1px solid black; padding: 5px; display: inline-block;">$75^\circ, 117^\circ, 110^\circ, 58^\circ$</div>
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1.3: Solving Equations with Variables on Both Sides

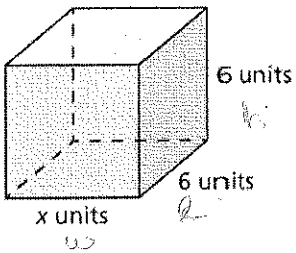
Solve the equation. Check your solution.

<p>1. $12 - 3x = -6x$ $+3x \quad +3x$ <hr/> $-3x = 12$ $-3 \quad -3$ $x = -4$</p>	<p>2. $7 - 5z = 17 + 5z$ $+5z \quad +5z$ $7 = 17 + 10z$ $-17 \quad -17$ $10z = -10$ $\frac{10z}{10} = \frac{-10}{10}$ $z = -1$</p>
<p>3. $3k + 45 = 8k + 25$ $-3k \quad -3k$ $45 = 5k + 25$ $-25 \quad -25$ <hr/> $20 = 5k$ $\frac{20}{5} = \frac{5k}{5}$ $k = 4$</p>	<p>4. $\frac{3}{4}(48 - 16x) = 4(4 + 2x)$ $3(12 - 4x) = 4(4 + 2x)$ $36 - 12x = 16 + 8x$ $+12x \quad +12x$ $20x + 16 = 36$ $-16 \quad -16$ $20x = 20$ $x = 1$</p>
<p>5. $5q + 6 = 2q - 2 + q$ $5q + 6 = 3q - 2$ $-3q \quad -3q$ <hr/> $2q + 6 = -2$ $-6 \quad -6$ $2q = -8$ $\frac{2q}{2} = \frac{-8}{2}$ $q = -4$</p>	<p>6. $8 + 6x - 10x = 16 - 8x$ $8 - 4x = 16 - 8x$ $+8x \quad +8x$ <hr/> $8 + 4x = 16$ $-8 \quad -8$ $4x = 8$ $\frac{4x}{4} = \frac{8}{4} \Rightarrow x = 2$</p>
<p>7. $6a - 4 = 3a + 5$ $-3a \quad -3a$ <hr/> $3a - 4 = 5$ $+4 \quad +4$ $3a = 9$ $\frac{3a}{3} = \frac{9}{3}$ $a = 3$</p> <p>Check: $6(3) - 4 = 3(3) + 5$ $18 - 4 = 9 + 5$ $14 = 14$</p>	<p>8. $2(4b - 6) = 4(3b - 7)$ $8b - 12 = 12b - 28$ $-8b \quad -8b$ $-12 = 4b - 28$ $+28 \quad +28$ <hr/> $16 = 4b$ $\frac{16}{4} = \frac{4b}{4}$ $b = 4$</p>
<p>9. $8(2r - 3) - r = 3(3r + 2)$ $16r - 24 - r = 9r + 6$ $15r - 24 = 9r + 6$ $-9r \quad -9r$ <hr/> $6r - 24 = 6$ $+24 \quad +24$ $6r = 30$ $\frac{6r}{6} = \frac{30}{6}$ $r = 5$</p>	<p>10. $3x - 8(2x + 3) = -6(2x + 5)$ $3x - 16x - 24 = -12x - 30$ $-13x - 24 = -12x - 30$ $+12x \quad +12x$ <hr/> $-x - 24 = -30$ $+24 \quad +24$ $-x = -6$ $x = 6$</p>

Solve the equation. Determine whether the equation has *one solution*, *no solution*, or *infinitely many solutions*.

<p>11. $6(4s + 12) = 8(3s - 14)$</p> <p>$24s + 72 = 24s - 112$</p> <p>$72 = -112$</p> <p>No Soln</p>	<p>12. $16f + 24 = 8(2f + 3)$</p> <p>$16f + 24 = 16f + 24$</p> <p>$24 = 24$</p> <p>inf. many soln</p>
<p>13. $\frac{1}{2}(10 + 12n) = \frac{1}{3}(15n + 15)$</p> <p>$5 + 6n = 5n + 5$</p> <p>$-5n - 5n$</p> <p>$5 + n = 5$</p> <p>$n = 0$</p>	<p>14. $\frac{2}{3}(6j + 9) = 3j + 7$</p> <p>$4j + 6 = 3j + 7$</p> <p>$-3j$</p> <hr/> <p>$j + 6 = 7$</p> <p>$-6$</p> <p>$j = 1$</p>

15. The value of the surface area of a rectangular prism is equal to the value of the volume of the rectangular prism. Write and solve an equation to find the value of x .



$$2(6x + 36 + 6x) = 36x$$

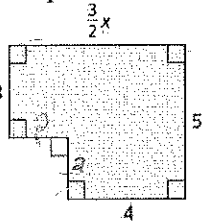
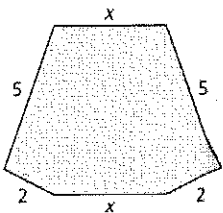
$$2(12x + 36) = 36x$$

$$24x + 72 = 36x$$

$$\frac{72}{12} = \frac{12x}{12} \quad x = 6$$

6 units

16. The two polygons have the same perimeter. Use this information to write and solve an equation involving x . Then find the perimeter of each polygon.



$$1) \quad 14 = 16 + \frac{3}{2}x$$

$$\quad \quad -14 \quad -14$$

$$2) \quad (2x = 2 + \frac{3}{2}x)$$

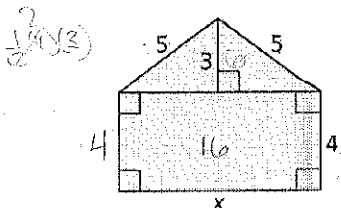
$$4x = 4 + 3x$$

$$\quad \quad -3x \quad -3x$$

$x = 4$ units

$\checkmark 22 = 22$

17. This figure has the unusual property that the value of its perimeter (in feet) is equal to the value of its area (in square feet). Use this information to write an equation for the figure. Solve the equation for x . Then find the perimeter and area of the figure.



$$x + 18 = 4x + \frac{1}{2} \cdot 3x$$

$$x + 12 = 4x + \frac{3}{2}x$$

$$2x + 36 = 8x + 3x$$

$$2x + 36 = 11x$$

$$\quad \quad -2x \quad -2x$$

$$36 = 9x$$

$$\quad \quad \div 9 \quad \div 9$$

$$x = 44$$

Area \checkmark
 $22 \cdot 2 = 22 \text{ ft}$

1.4: Solving Absolute Value Equations

absolute value equation: an equation that contains an absolute value expression.

extraneous solution: an apparent solution that does not satisfy the original equation.

Solving Absolute Value Equations

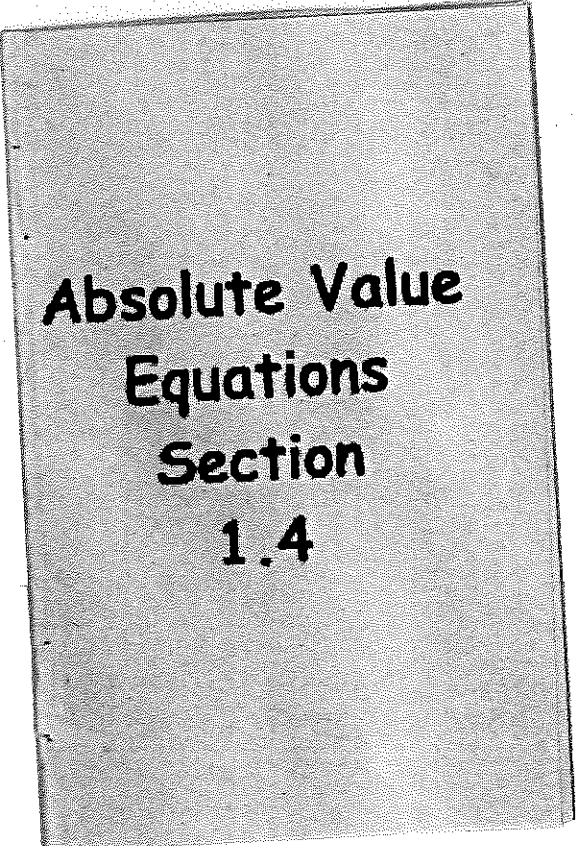
To solve $|ax + b| = c$ when $c \geq 0$, solve the related linear equations

$$ax + b = c \quad \text{or} \quad ax + b = -c.$$

When $c < 0$, the absolute value equation $|ax + b| = c$ has no solution because absolute value always indicates a number is not negative.

Steps

- 1) Isolate the absolute value equation
- 2) rewrite equation into two equations with + & - quantity on the other
- 3) solve both EQs
- 4) check for extraneous solutions



**Absolute Value
Equations
Section
1.4**

Absolute Value Equations Section 1.4

$$x = \{-5, 5\}$$

$$x = 5 \quad x = -5$$

$$|x| = 5$$

$$\begin{aligned} |123-16| &= 7 \\ |1-7| &= 7 \\ |19-16| &= 7 \end{aligned}$$

$$r = \{9, 23\}$$

$$\begin{aligned} \frac{r-10}{+16} &= -7 \\ r &= 9 \\ \frac{r-10}{+16} &= 7 \\ r &= 23 \end{aligned}$$

$$|r-16| = 7$$

$$\begin{aligned} |1-5(-28)| &= 29 \\ |1+18| &= 29 \\ |1-5(6)| &= 29 \\ |1-30| &= 29 \\ |1-29| &= 29 \end{aligned}$$

$$a = \{-28, 6\}$$

$$\begin{aligned} |1-5a| &= 29 \\ |1-5(-28)| &= 29 \\ |1-5(6)| &= 29 \end{aligned}$$

$$|1-5a| = 29$$

Not possible

$$|x+2| = -3$$

$$|b + \frac{3}{2}|4x| = 21$$

$$\begin{aligned} \frac{3}{2}|4x| &= 18 \\ |4x| &= 12 \end{aligned}$$

$$\begin{aligned} 4x &= 12 & x &= 3 \\ 4x &= -12 & x &= -3 \end{aligned}$$

$$x = \{-3, 3\}$$

$$|c-24| = 7c$$

$$\begin{aligned} c-24 &= 7c & c-24 &= -7c \\ -24 &= -8c & c &= 3 \end{aligned}$$

extraneous
c = 3

$$\begin{aligned} |4-24| &= 7(-4) \\ | -20 | &= -28 \end{aligned}$$

$$|v+8| - \sqrt{5} = 2$$

$$|v+8| = 7$$

$$\begin{aligned} v+8 &= 7 & v &= -1 \\ v+8 &= -7 & v &= -15 \end{aligned}$$

$$v = \{-1, -15\}$$

1.5: Rewriting Equations and Formulas

literal equation: An equation with several variables. Usually, one variable will be isolated.

formula: A special type of equation that represents the relationship between variables.

Common Formulas

Temperature F = degrees Fahrenheit, C = degrees Celsius

$$C = \frac{5}{9}(F - 32)$$

Simple Interest I = interest, P = principal,

r = annual interest rate (decimal form),

t = time (years)

$$I = Prt$$

Distance d = distance traveled, r = rate, t = time

$$d = rt$$

Solve the literal equation for y .

<p>1. $y - 2x = 15$ ✓ $+2x \quad +2x$ $y = 2x + 15$</p>	<p>2. $4x + y = 2$ $-4x \quad -4x$ $y = -4x + 2$</p>
<p>3. $5x - 2 = 8 + 5y$ $-8 \quad -8$ $\frac{5y = 5x - 10}{5 \quad 5 \quad 5}$ $y = x - 2$</p>	<p>4. $y + x = 11$ $-x \quad -x$ $y = -x + 11$</p>

5. $3x - y = -4$

$$\begin{array}{r} -3x + y = 4 \\ +3x \qquad +3x \end{array}$$

$$y = 3x + 4$$

6. $3x + 1 = 7 - 4y$

$$\begin{array}{r} -3x - 1 = -7 + 4y \\ +7 \qquad +7 \end{array}$$

$$\frac{-3x + 6}{4} = \frac{4y}{4}$$

$$y = -\frac{3}{4}x + \frac{3}{2}$$

Solve the formula for the indicated variable.

13. Area of a triangle: $(A = \frac{1}{2}bh)$ Solve for b .

$$\frac{2A}{n} = \frac{bh}{n}$$

$$b = \frac{2A}{n}$$

14. Volume of a cone: $(V = \frac{1}{3}\pi r^2 h)$ Solve for h .

$$\frac{3V}{\pi r^2} = \frac{\pi r^2 h}{\pi r^2}$$

$$h = \frac{3V}{\pi r^2}$$

15. Ohm's Law: $(I = \frac{V}{R})$ Solve for R .

$$RI = V$$

16. Ideal Gas Law: $PV = nRT$; Solve for R .

$$R = \frac{PV}{nt}$$

17. The amount A of money in an account after simple interest has been earned is given by the formula $A = P + Prt$ where P is the principal, r is the annual interest rate in decimal form, and t is the time in years.

a. Solve the formula for r .

$$\begin{array}{l} A = P + Prt \\ -P \quad -P \\ \hline A - P = Prt \\ \frac{A - P}{Pt} = \frac{Prt}{Pt} \end{array}$$

$$r = \frac{A - P}{Pt} - \frac{1}{t}$$

b. Solve the formula for P .

$$\begin{array}{l} A = P + Prt \\ A = P(1 + rt) \\ \frac{A}{1 + rt} = \frac{P(1 + rt)}{1 + rt} \end{array}$$

$$P = \frac{A}{1 + rt}$$