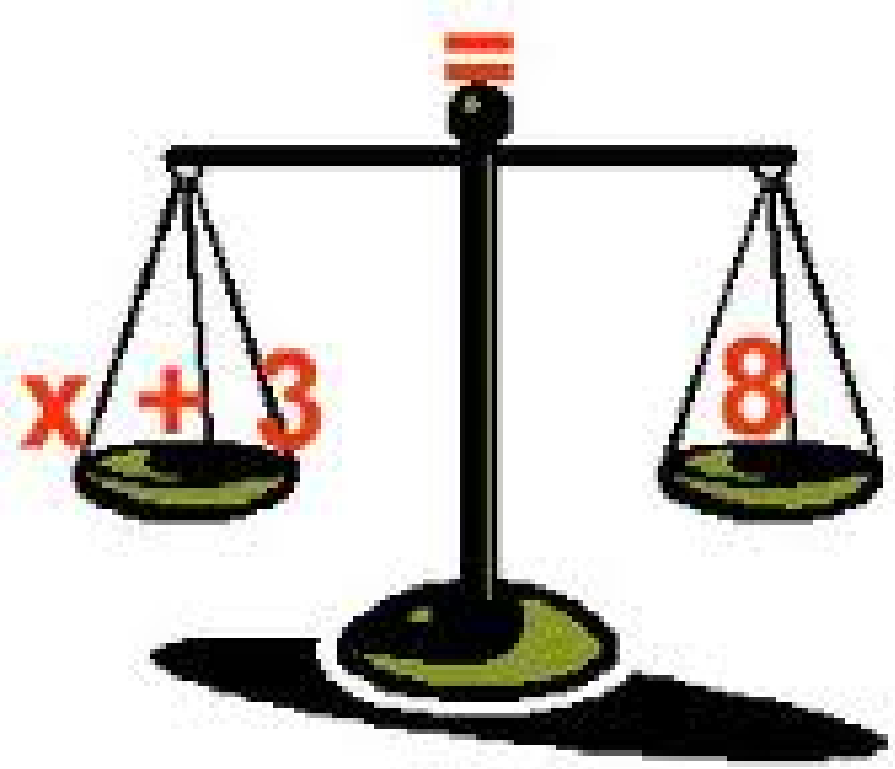
Algebra

Chapter 2A: Equations



Name:_____

Teacher:_____

Pd: _____

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Chapter 2 - 3 (A)

SWBAT: Solve equations in one variable that contain more than one operation

Warm – Up

Simplify each expression.

1. $10c + c$

2. $5m + 2(2m - 7)$

3. $6x - (2x + 5)$

Example 1: Solving Two-Step Equations

Solve the equation. Check your solution.

A) $5t - 2 = -32$

B) $18 = 4a + 10$

Practice: Solving Two-Step Equations

Solve the equation. Check your solution.

1) $3x + 6 = -3$

2) $-x + 7 = -21$

3) $39 = -3x + 3$

Example 2: Simplifying Before Solving Equations
Solve the equation. Check your solution.

C) **Solve $8x - 21 + 5x = -15$.**

Practice: Simplifying Before Solving Equations
Solve the equation. Check your solution.

1) $5x + 4 - 2x = 10$

2) $-5 + x + 16 = -3$

3) $x - 6 - 10 = 0$

4) $x - 4x + 3 = -30$

5) $7x + 14 - 5x = -8$

6) $3x - 7x + 12 = 32$

Example 3: Simplifying Before Solving Equations
Solve the equation. Check your solution.

D) $-2(3 - d) = 4$

E) $4(x - 2) + 2x = 40$

Example 3: Simplifying Before Solving Equations
Solve the equation. Check your solution.

1) $2(x-1)=8$

2) $27=3(x-12)$

3) $5(4x-4)=-60$

4) $3(x-2)+5=14$

5) $-4(x+2)-3x=6$

6) $18=-2(x-5)+4x$

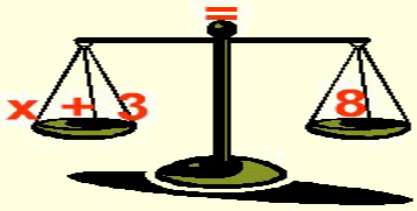
Challenge Problem: Problem-Solving Application
Solve this equation for y:

$7y + 5 - 3y + 1 - 2y = 2$

Summary:

Solving linear equations is just a matter of undoing operations that are being done to the variable. The task is always to isolate the variable -- get the variable ALONE on one side of the equal sign.

Remember when solving equations to "keep the equation balanced" by making the same changes to BOTH sides of the equal sign.



Exit Ticket

What is the solution of the equation
$3y - 5y + 10 = 36$

1) -13
2) 2
3) 4.5
4) 13

Chapter 2 – 3(A) Homework (Holt Page 96)

Solve each equation. Check your answer.

1. $4a + 3 = 11$

2. $8 = 3r - 1$

3. $42 = -2d + 6$

4. $x + 0.3 = 3.3$

5. $15y + 31 = 61$

6. $9 - c = -13$

13. $28 = 8x + 12 - 7x$

14. $2y - 7 + 5y = 0$

15. $2.4 = 3(m + 4)$

16. $3(x - 4) = 48$

17. $4t + 7 - t = 19$

18. $5(1 - 2w) + 8w = 15$

36. $6 = -2(7 - c)$

37. $5(h - 4) = 8$

38. $-3x - 8 + 4x = 17$

39. $4x + 6x = 30$

40. $2(x + 3) = 10$

41. $17 = 3(p - 5) + 8$

Extra Practice For Students Who Need More Practice

Solve each equation. Check your answers.

1. $-4x + 7 = 11$

2. $17 = 5y - 3$

3. $-4 = 2p + 10$

10. $-(x - 10) = 7$

11. $-2(b + 5) = -6$

12. $8 = 4(q - 2) + 4$

10. $x + -4 + 2x = 14$

11. $4(y + 1) = -8$

12. $-2(d + 6) = -10$

3. $5y + 4 - 2y = 9$

4. $14 = 3(x - 2) + 5$

Chapter 2 - 3 (B)

SWBAT: Solve Equations with Rational Coefficients

Warm – Up

Solve the following equations:

1. 5c - 4 - 10c + 1 = 2

2. -3(y - 1) = 9

Example 1: Solving Equations that Contain Fractions
Solve the equation. Check your solution.

A) $\frac{2}{3}x = 20$

Method #1

Method #2

B) $-\frac{4}{5}x = 20$

Method #1

Method #2

Practice: Solving Equations that Contain Fractions
Solve the equation. Check your solution.

1) $\frac{5}{8}x = 30$

2) $\frac{7}{11}x = 14$

3) $28 = \frac{14x}{15}$

4) $-\frac{5}{6}x = 20$

5) $-24 = -\frac{12x}{19}$

6) $\frac{5}{7}x = 35$

Example 2: Solving Equations that Contain Fractions
Solve the equation. Check your solution.

C) $\frac{2}{5}x + 4 = 10$

Practice: Solving Equations that Contain Fractions
Solve the equation. Check your solution.

7) $\frac{x}{2} + 9 = 36$

8) $\frac{4}{7}x + 8 = 28$

9) $14 = -\frac{2}{3}x - 10$

10) $\frac{3}{5}x - 8 = 22$

11) $32 = 16 - \frac{1}{2}x$

12) $\frac{1}{3}x + 6 = -8$

Challenge Problem: Problem-Solving Application

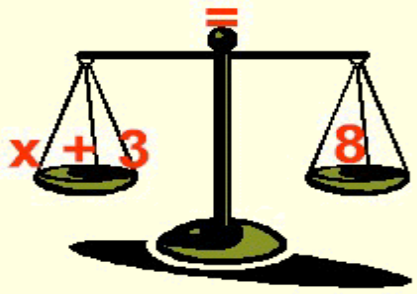
Solve For x:

$$(2\frac{1}{4})x = 4\frac{1}{2}$$

Summary:

Solving linear equations is just a matter of undoing operations that are being done to the variable. The task is always to isolate the variable -- get the variable ALONE on one side of the equal sign.

Remember when solving equations to "keep the equation balanced" by making the same changes to BOTH sides of the equal sign.



Exit Ticket

Solve: $\frac{5}{8}y - 8 = 2$

[A] 15 [B] $6\frac{1}{4}$ [C] 16 [D] $-9\frac{3}{5}$

SPIRAL REVIEW

Write all classifications that apply to each real number. *(Lesson 1-5)*

81. $\sqrt{3}$ **82.** -58 **83.** $2\frac{1}{3}$ **84.** 0.17

Solve each equation. *(Lesson 2-1)*

89. $17 = k + 4$ **90.** $x - 18 = 3$ **91.** $a + 6 = -12$ **92.** $-7 = q - 7$

Chapter 2 – 3(B) Homework (Holt Page 96)

Solve the equation. Check your solution.

$\frac{x}{6} = 20$

$\frac{x}{-5} = 20$

$-9 = \frac{x}{-2}$

$\frac{x}{6} + 4 = 15$

$15 = \frac{a}{3} - 2$

$4 - \frac{m}{2} = 10$

$-\frac{1}{3}x - 9 = -16$

$\frac{3}{4}x + 7 = 28$

$\frac{y}{3} - 8 = 1$

$10 = -\frac{3}{7}x - 8$

$-1 = \frac{b}{4} - 7$

$-6 = \frac{y}{5} + 4$

Chapter 2 - 4

SWBAT: Solve equations in one variable that contain variable terms on both sides

Warm – Up

Solve each equation. Check your answer.

1. $3(x - 2) = 18$

2. $(x + 6) - (2x + 7) - 3x = -9$

Example 1: Solving Equations with Variables on Both Sides
Solve the equation. Check your solution.

A) $-15 + 4x = -6x + 5$

Practice: Solving Two-Step Equations
Solve the equation. Check your solution.

1) $10x + 3 = 6x - 17$

2) $8x + 15 = 3x - 20$

3) $9x - 2 = 7x + 50$

Example 2: Simplifying Each Side Before Solving Equations
Solve the equation. Check your solution.

B) Solve: $-2(1 - b) = -5b + 2b + 8$

Practice: Simplifying Each Side Before Solving Equations
Solve the equation. Check your solution.

10) $4(2x + 9) = 3x - 14$ 11) $9(x - 2) = x + 40$ 12) $-3(-2x + 5) = 11 - 4x$

- An identity is an equation that is true for all values of the variable. An equation that is an identity has infinitely many solutions.

Identities and Contradictions	
WORDS	**Identity** When solving an equation, if you get an equation that is always true, the original equation is an identity, and it has infinitely many solutions.
NUMBERS	$2 + 1 = 2 + 1$ $3 = 3$ ✓
ALGEBRA	$2 + x = 2 + x$ $-x \quad -x$ $2 = 2$ ✓

❖ A contradiction is an equation that is not true for any value of the variable. It has no solutions.

Identities and Contradictions	
WORDS	**Contradiction** When solving an equation, if you get a false equation, the original equation is a contradiction, and it has no solutions.
NUMBERS	$1 = 1 + 2$ $1 = 3$ ×
ALGEBRA	$x = x + 3$ $-x \quad -x$ $0 = 3$ ×

Example 3: Solving Equations with Infinitely Many Solutions or No Solutions
Solve each.

$10 - 5x + 1 = 7x + 11 - 12x$.

$12x - 3 + x = 5x - 4 + 8x$.

Practice: Solving Equations with Infinitely Many Solutions or No Solutions
Solve the equation.

$4y + 7 - y = 10 + 3y$

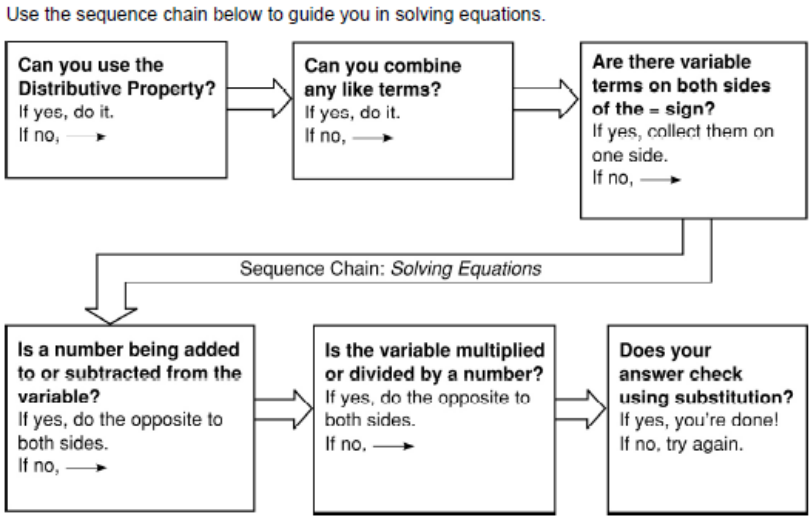
$2c + 7 + c = -14 + 3c + 21$.

Challenge Problem: Problem-Solving Application

Solve the equation. Check your solution.

$$4x + 2[4 - 2(x + 2)] = 2x - 4$$

Summary:



Exit Ticket

If $2(x + 3) = x + 10$, then x equals

1) 14
2) 7
3) 5
4) 4

Chapter 2 - 4 Homework (Holt Page 103)

Solve each equation. Check your answer.

15. $7a - 17 = 4a + 1$

16. $2b - 5 = 8b + 1$

17. $4x - 2 = 3x + 4$

18. $2x - 5 = 4x - 1$

19. $8x - 2 = 3x + 12.25$

20. $5x + 2 = 3x$

21. $3c - 5 = 2c + 5$

22. $-17 - 2x = 6 - x$

23. $3(t - 1) = 9 + t$

24. $5 - x - 2 = 3 + 4x + 5$

25. $2(x + 4) = 3(x - 2)$

26. $3m - 10 = 2(4m - 5)$

27. $x + 2 = x + 4$

28. $2(f + 3) + 4f = 6 + 6f$

Chapter 2 – 5(A)

SWBAT: Solve an equation in two or more variables for one of the variables

Warm – Up

Solve each equation. Check your answer.

1. $7x + 2 = 5x + 8$
2. $4(2x – 5) = 5x + 4$

Solving for a Variable	
Step 1	Locate the variable you are asked to solve for in the equation.
Step 2	Identify the operations on this variable and the order in which they are applied.
Step 3	Use inverse operations to undo operations and isolate the variable.

Example 1: Solving Literal Equations

Solve for the indicated variable.

1) $d = rt$ for r

Practice: Solving Literal Equations
Solve for the indicated variable.

1) $S = 2\pi rh$ for h 2) $k = wxy$ for x 3) $P = IRT$ for T

Example 2: Solving Literal Equations
Solve for the indicated variable.

2) B = T - LC for T

Practice: Solving Literal Equations
Solve for the indicated variable.

4) $m = bx + t$ for t 5) $d = w - yx$ for w

Example 3: Solving Literal Equations
Solve for the indicated variable.

3) T = p + prt for r

Practice: Solving Literal Equations
Solve for the indicated variable.

6) $y = mx + b$ for x 7) $a = kt + p$ for k 8) $h = vt - 16t^2$ for v

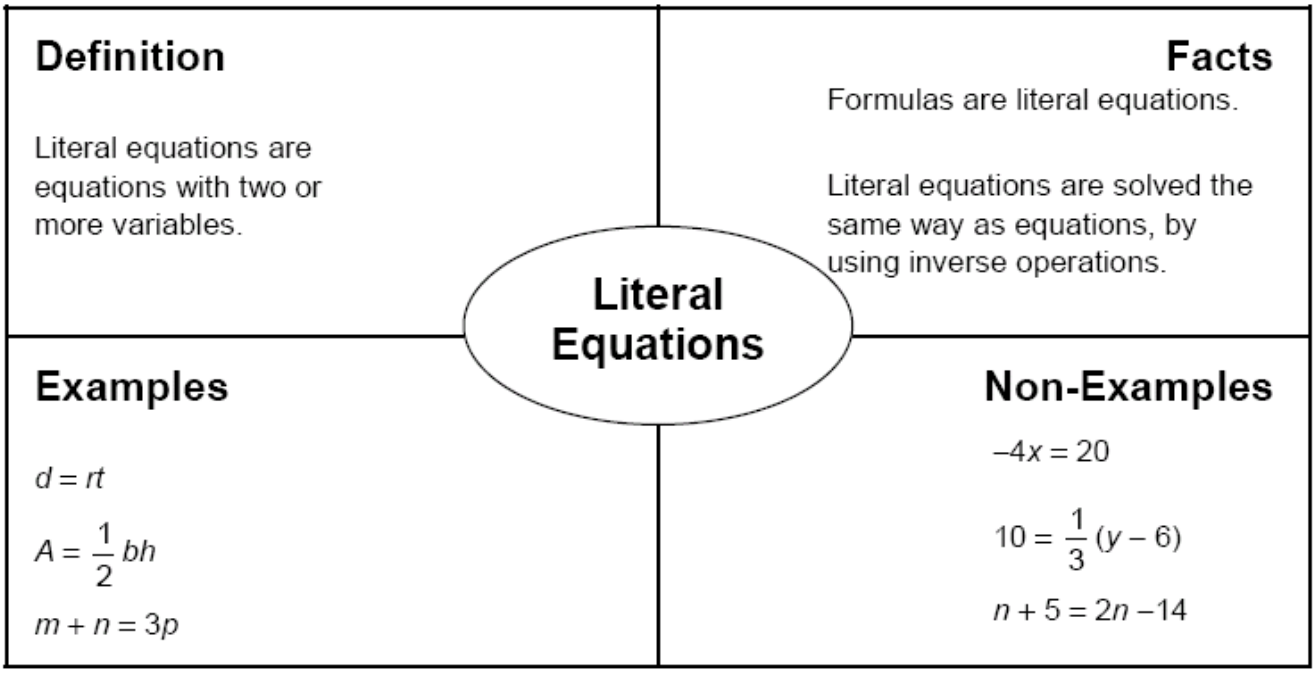
Challenge Problem: Problem-Solving Application

Solve for the indicated variable.

$$\frac{a}{b} - c = d \quad \text{for a}$$

Summary:

Use the concept map below to help you understand literal equations.



Exit Ticket

If $bx - 2 = K$, then x equals

1) $\frac{K}{b} + 2$

2) $\frac{K-2}{b}$

3) $\frac{2-K}{b}$

4) $\frac{K+2}{b}$

Chapter 2 – 5(A) Homework (Holt Page 110)

Solve for the indicated variable.

17. $y = mx + b$ for x

18. $a = 3n + 1$ for n

19. $PV = nRT$ for T

20. $T + M = R$ for T

21. $M = T - R$ for T

22. $PV = nRT$ for R

23. $2a + 2b = c$ for b

24. $5p + 9c = p$ for c

25. $ax + r = 7$ for r

26. $3x + 7y = 2$ for y

27. $4y + 3x = 5$ for x

28. $y = 3x + 3b$ for b

Chapter 2 – 5(B)

SWBAT: Solve an equation in two or more variables for one of the variables

Warm – Up

Solve for B:

$S = 2B + Ph$

Solving for a Variable
Step 1 Locate the variable you are asked to solve for in the equation.
Step 2 Identify the operations on this variable and the order in which they are applied.
Step 3 Use inverse operations to undo operations and isolate the variable.

Example 1: Solving Literal Equations

Solve for y.

$3x + y = 12$

Practice: Solving Literal Equations
Solve for y.

1. $-2x + y = 8$
2) $16 = 4x + y$
3) $5 = y - x$

Example 2: Solving Literal Equations
Solve for y.

$$6x + 2y = 10$$

Practice: Solving Literal Equations
Solve for y.

1) $4x + 2y = 16$
2) $20 = 15x + 5y$
3) $6x - 3y = 12$

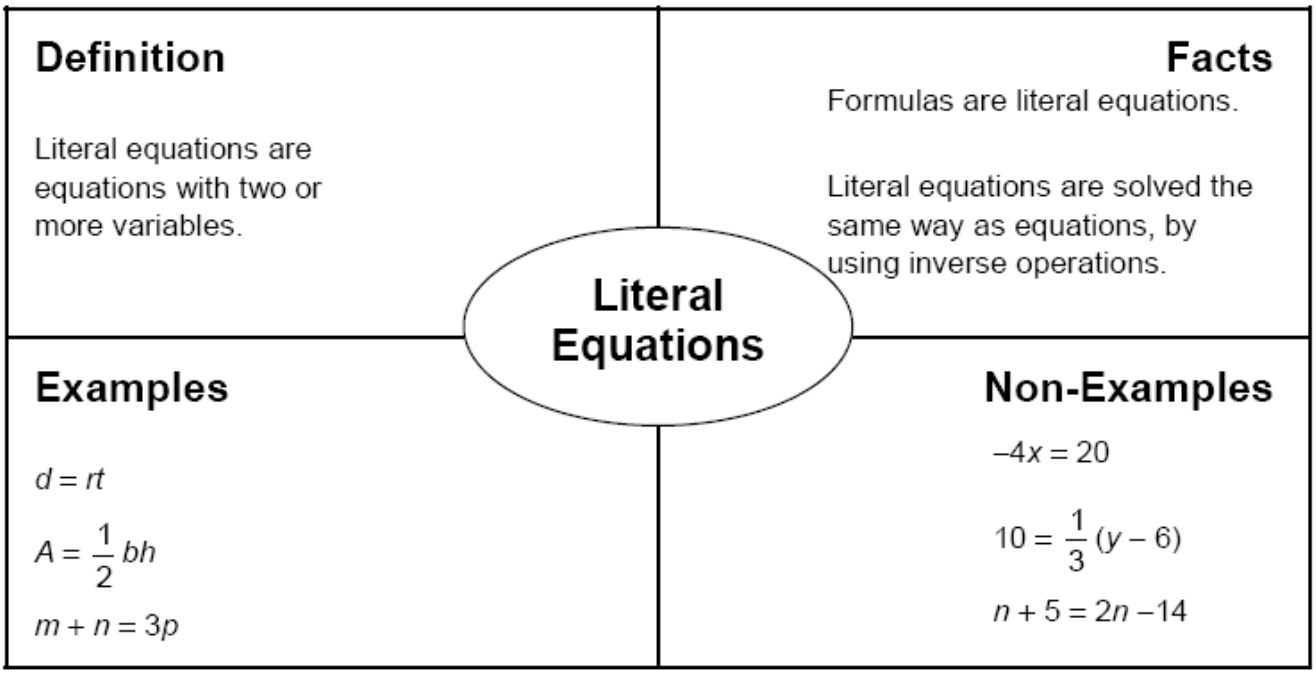
4) $8x - 2y = -14$
5) $-9x - 3y = -27$
6) $-3y - x = -12$

Challenge Problem: Problem-Solving Application
Solve for y.

$4x + 6x - 3y - 2y = -25$

Summary:

Use the concept map below to help you understand literal equations.



Exit Ticket
Solve for y.

Which equation is equivalent to $3x + 4y = 15$?

1) $y = \frac{15 - 3x}{4}$
2) $y = \frac{3x - 15}{4}$
3) $y = 15 - 3x$
4) $y = 3x - 15$

Chapter 2 – 5(B) - HOMEWORK

Write the equation so that y is a function of x. (Solve for y).

1) $2x + y = -2$

2) $5x - 4y = 0$

3) $2x + y = 3$

4) $2x + y = 2$

5) $3x + 4y = 32$

6) $x + 8y = -40$

7) $7x + y = -7$

8) $6x + y = 1$

9) $4x + 3y = 15$

10) $13x + 2y = -10$

11) $5y + 2x = 5$

12) $12x - 27 = 3y$

13) $-2y - x = -2$

14) $-x = -4y$

15) $6 + 2x - 5y = 0$

16) $5y + x = -10$

Solve each equation.

17) $1 + \frac{r}{16} = 2$

18) $\frac{x}{10} - 3 = -4$

19) $-14 + 7b = -7(2 - 7b) - 3b$

20) $5 + 8(-4n - 8) = -26 + n$