

Name _____

SOLVING EQUATIONS—VARIABLES ON BOTH SIDES #1

Directions: Solve for x in each equation below. Use inverse operations to get the variable all by itself on one side of the equation, and then get the integers (numbers) alone on the other side of the equation.

Examples: $5x = 2x + 48$ (subtract $2x$ from both sides)
 $3x = 48$ (divide both sides by 3)
 $x = 16$

$5x + 12 = 2x + 36$ (subtract $2x$ from both sides)
 $3x + 12 = 36$ (subtract 12 from both sides)
 $3x = 24$ (divide both sides by 3)
 $x = 8$

1) $3x = 2x + 50$

2) $6x = 2x + 44$

3) $8x = 2x + 36$

4) $4x = x + 18$

$x =$ _____

$x =$ _____

$x =$ _____

$x =$ _____

5) $7x + 10 = 3x + 120$

6) $20 + 2x = x + 56$

7) $6x + 16 = 2x + 28$

8) $12x + 12 = 3x + 84$

$x =$ _____

$x =$ _____

$x =$ _____

$x =$ _____

9) $3 + 6x = 2x + 27$

10) $8x + 2 = 72 + x$

11) $2x + 20 = x + 60$

12) $4x + 1 = 25 + 2x$

$x =$ _____

$x =$ _____

$x =$ _____

$x =$ _____

Name _____

SOLVING EQUATIONS—VARIABLES ON BOTH SIDES #1--KEY

Directions: Solve for x in each equation below. Use inverse operations to get the variable all by itself on one side of the equation, and then get the integers (numbers) alone on the other side of the equation.

Examples: $5x = 2x + 48$ (subtract $2x$ from both sides)
 $3x = 48$ (divide both sides by 3)
 $x = 16$

$$x = 8$$

1) $3x = 2x + 50$

2) $6x = 2x + 44$

3) $8x = 2x + 36$

4) $4x = x + 18$

$$x = \frac{50}{11} \qquad x = \frac{11}{6} \qquad x = \frac{6}{6}$$

5) $7x + 10 = 3x + 120$

6) $20 + 2x = x + 56$

7) $6x + 16 = 2x + 28$

8) $12x + 12 = 3x + 84$

$$x = \frac{11}{36} \qquad x = \frac{3}{8}$$

pg 2

$$9) 3 + 6x = 2x + 27$$

$$10) 8x + 2 = 72 + x$$

$$11) 2x + 20 = x + 60$$

$$12) 4x + 1 = 25 + 2x$$

$$x = \underline{\underline{12}}$$

$$x = \underline{\underline{40}}$$

$$x = \underline{\underline{12}}$$

Name _____

SOLVING EQUATIONS—VARIABLES ON BOTH SIDES #2

Directions: Solve for x in each equation below. Use inverse operations to get the variable all by itself on one side of the equation, and then get the integers (numbers) alone on the other side of the equation.

Examples: $5x - 21 = 2x - 6$ (add 21 to both sides) $5x - 12 = 2x - 9$ (add 12 to both sides)
 $5x = 2x + 15$ (subtract 2x from both sides) $5x = 2x + 3$ (subtract 2x from both sides)
 $3x = 15$ (divide both sides by 3) $3x = 3$ (divide both sides by 3)
 $x = 5$ $x = 1$

1) $3x - 61 = 2x - 50$ 2) $6x - 64 = 2x - 44$ 3) $8x - 90 = 2x - 36$ 4) $4x - 18 = x - 3$

$x =$ _____ $x =$ _____ $x =$ _____ $x =$ _____

5) $3x - 71 = 2x - 50$ 6) $6x - 68 = 2x - 44$ 7) $8x - 72 = 2x - 36$ 8) $4x - 21 = x - 18$

$x =$ _____ $x =$ _____ $x =$ _____ $x =$ _____

9) $4x - 82 = 2x - 50$ 10) $5x - 68 = 2x - 44$ 11) $8x - 88 = 2x - 34$ 12) $4x - 50 = 2x - 8$

$x =$ _____ $x =$ _____ $x =$ _____ $x =$ _____

Name _____

SOLVING EQUATIONS—VARIABLES ON BOTH SIDES #2--KEY

Directions: Solve for x in each equation below. Use inverse operations to get the variable all by itself on one side of the equation, and then get the integers (numbers) alone on the other side of the equation.

Examples:

$$5x - 21 = 2x - 6 \quad (\text{add } 21 \text{ to both sides})$$

$$5x = 2x + 15 \quad (\text{subtract } 2x \text{ from both sides})$$

$$3x = 15 \quad (\text{divide both sides by } 3)$$

$$x = 5$$

$$1) 3x - 61 = 2x - 50$$

$$2) 6x - 64 = 2x - 44$$

$$3) 8x - 90 = 2x - 36$$

$$4) 4x - 18 = x - 3$$

$$x = \underline{\underline{11}}$$

$$x = \underline{\underline{5}}$$

$$x = \underline{\underline{9}}$$

$$x = \underline{\underline{5}}$$

$$5) 3x - 71 = 2x - 50$$

$$6) 6x - 68 = 2x - 44$$

$$7) 8x - 72 = 2x - 36$$

$$8) 4x - 21 = x - 18$$

$$x = \underline{\underline{21}}$$

$$x = \underline{\underline{6}}$$

$$x = \underline{\underline{1}}$$

$$9) 4x - 82 = 2x - 50$$

$$10) 5x - 68 = 2x - 44$$

$$11) 8x - 88 = 2x - 34$$

$$12) 4x - 50 = 2x - 8$$

$$x = \underline{\underline{16}}$$

$$x = \underline{\underline{8}}$$

$$x = \underline{\underline{9}}$$

$$x = \underline{\underline{21}}$$

Name _____

SOLVING EQUATIONS—VARIABLES ON BOTH SIDES #3

Directions: Solve for x in each equation below. Use inverse operations to get the variable all by itself on one side of the equation, and then get the integers (numbers) alone on the other side of the equation.

Examples: $5x - 2 = x + 26$ (add 2 to both sides) $5x + 12 = 2x - 9$ (subtract 12 from both sides)

$5x = x + 28$ (subtract x from both sides) $5x = 2x - 21$ (subtract $2x$ from both sides)

$4x = 28$ (divide both sides by 4) $3x = -21$ (divide both sides by 3)

$x = 7$

$x = -7$

1) $3x - 21 = 2x + 5$

2) $6x - 64 = 2x + 44$

3) $8x - 20 = 2x + 34$

4) $4x - 18 = x + 3$

$x =$ _____

$x =$ _____

$x =$ _____

$x =$ _____

5) $7x + 21 = 2x - 49$

6) $6x + 68 = 2x - 44$

7) $8x + 72 = 2x - 36$

8) $4x + 21 = x - 18$

$x =$ _____

$x =$ _____

$x =$ _____

$x =$ _____

9) $4x - 12 = 2x + 50$

10) $5x + 8 = 4x - 4$

11) $4x - 18 = 2x + 34$

12) $4x + 6 = 2x - 8$

$x =$ _____

$x =$ _____

$x =$ _____

$x =$ _____

Name _____

SOLVING EQUATIONS—VARIABLES ON BOTH SIDES #3--KEY

Directions: Solve for x in each equation below. Use inverse operations to get the variable all by itself on one side of the equation, and then get the integers (numbers) alone on the other side of the equation.

Examples: $5x - 2 = x + 26$

(add 2 to both sides)

$5x + 12 = 2x - 9$

(subtract 12 from both sides)

$5x = 2x - 21$

(subtract $2x$ from both sides)

$3x = -21$

(divide both sides by 3)

$x = -7$

$$1) 3x - 21 = 2x + 5$$

$$2) 6x - 64 = 2x + 44$$

$$3) 8x - 20 = 2x + 34$$

$$4) 4x - 18 = x + 3$$

$$x = \underline{\underline{26}}$$

$$x = \underline{\underline{27}}$$

$$x = \underline{\underline{9}}$$

$$x = \underline{\underline{7}}$$

$$5) 7x + 21 = 2x - 49$$

$$6) 6x + 68 = 2x - 44$$

$$7) 8x + 72 = 2x - 36$$

$$8) 4x + 21 = x - 18$$

$$x = \underline{\underline{-14}}$$

$$x = \underline{\underline{-28}}$$

$$x = \underline{\underline{-18}}$$

$$x = \underline{\underline{-13}}$$

$$9) 4x - 12 = 2x + 50$$

$$10) 5x + 8 = 4x - 4$$

$$11) 4x - 18 = 2x + 34$$

$$12) 4x + 6 = 2x - 8$$

PG 8

$$x = \underline{\underline{31}}$$

$$x = \underline{-12}$$

$$x = \underline{\underline{26}}$$

$$x = \underline{\underline{-7}}$$

Multi-Step Equations**Solve each equation.**

1) $-20 = -4x - 6x$

2) $6 = 1 - 2n + 5$

3) $8x - 2 = -9 + 7x$

4) $a + 5 = -5a + 5$

5) $4m - 4 = 4m$

6) $p - 1 = 5p + 3p - 8$

7) $5p - 14 = 8p + 4$

8) $p - 4 = -9 + p$

9) $-8 = -(x + 4)$

10) $12 = -4(-6x - 3)$

11) $14 = -(p - 8)$

12) $-(7 - 4x) = 9$

13) $-18 - 6k = 6(1 + 3k)$

14) $5n + 34 = -2(1 - 7n)$

15) $2(4x - 3) - 8 = 4 + 2x$

16) $3n - 5 = -8(6 + 5n)$

17) $-(1 + 7x) - 6(-7 - x) = 36$

18) $-3(4x + 3) + 4(6x + 1) = 43$

19) $24a - 22 = -4(1 - 6a)$

20) $-5(1 - 5x) + 5(-8x - 2) = -4x - 8x$

Multi-Step Equations**Solve each equation.**

1) $-20 = -4x - 6x$

{2}

2) $6 = 1 - 2n + 5$

{0}

3) $8x - 2 = -9 + 7x$

{-7}

4) $a + 5 = -5a + 5$

{0}

5) $4m - 4 = 4m$

No solution.

6) $p - 1 = 5p + 3p - 8$

{1}

7) $5p - 14 = 8p + 4$

{-6}

8) $p - 4 = -9 + p$

No solution.

9) $-8 = -(x + 4)$

{4}

10) $12 = -4(-6x - 3)$

{0}

11) $14 = -(p - 8)$

{-6}

12) $-(7 - 4x) = 9$

{4}

13) $-18 - 6k = 6(1 + 3k)$

{-1}

14) $5n + 34 = -2(1 - 7n)$

{4}

15) $2(4x - 3) - 8 = 4 + 2x$

{3}

16) $3n - 5 = -8(6 + 5n)$

{-1}

17) $-(1 + 7x) - 6(-7 - x) = 36$

{5}

18) $-3(4x + 3) + 4(6x + 1) = 43$

{4}

19) $24a - 22 = -4(1 - 6a)$

No solution.

20) $-5(1 - 5x) + 5(-8x - 2) = -4x - 8x$

{-5}

6.4 Solving Equations with Fractional Coefficients Worksheet #1

Complete the following on a separate piece of paper!

A. Solve for the variable.

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

5) $-\frac{3}{4}z + 5 = -1$

2) $\frac{1}{3}r - 3 = -6$

6) $9t - \frac{3}{5} = -\frac{6}{5}$

3) $7x - \frac{5}{9} = 3$

7) $10t - \frac{2}{5} = \frac{3}{5}$

4) $\frac{2}{5}t + 3 = 11$

8) $\frac{1}{7}x - 1 = \frac{9}{7}$

B. Solve for the variable.

1) $\frac{a}{4} = \frac{1}{2}$

3) $\frac{1}{3} = \frac{-2x}{5}$

2) $\frac{x}{5} = \frac{-1}{2}$

4) $\frac{2}{3} = \frac{t}{6}$

C. Solve for the variable.

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

6) $\frac{1}{2}x + \frac{1}{3}x = 10$

2) $\frac{2}{5}a + \frac{a}{2} = a - 2$

7) $\frac{a}{5} - a = \frac{1}{2}$

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

8) $\frac{m}{6} - 5 = \frac{1}{2}m$

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

9) $-\frac{1}{3}x + \frac{3}{4}x = 10$

5) $\frac{2a}{3} = \frac{3a}{5} + 4$

10) $\frac{3}{5}x - \frac{3}{2}x = 10$

Answers:

A) 1) $\frac{3}{4}$ 2) -9 3) $\frac{32}{63}$ 4) 20 5) 8 6) $-\frac{1}{15}$ 7) $\frac{1}{10}$ 8) 16

B) 1) 2 2) $-2\frac{1}{2}$ 3) $-\frac{5}{6}$ 4) 4

C) 1) 14 2) 20 3) -16 4) $-1\frac{1}{2}$ 5) 60 6) 12 7) $-\frac{5}{8}$ 8) -15 9) 24 10) $-11\frac{1}{9}$

SOLVING EQUATIONS INVOLVING FRACTIONS

Worksheet 3

Summary: To solve equations, use the addition/multiplication principles to “**Get rid of...**”

1. Parentheses by using the distributive property. If no fractions, combine like terms.
2. Denominators: Multiply each side of equation by common denominator.
Decimals: Multiply each side of equation by 10, 100, 1000, etc. **COMBINE LIKE TERMS.**

BEFORE NEXT STEP EACH SIDE SHOULD BE NO MORE COMPLICATED THAN:
“**4x – 8**”

3. Signs (addition or subtraction) by using the addition principle (**add opposites**).
Get variable terms on one side of the equation and all constant terms on the other side. Goal: Each side of equation is no more complicated than “ $4x = -9$.”
4. Coefficients by dividing by coefficient (BY SAME NUMBER). Goal: $x = \text{number}$

$$1. \frac{m}{4} = -3$$

$$2. \frac{1}{4}x = 5$$

$$3. \frac{t}{-3} = 6$$

$$4. -6 = \frac{3x}{5}$$

$$5. \frac{-2}{7}x = 6$$

$$6. -5 = \frac{-x}{6}$$

$$7. \frac{-m}{8} = -5$$

$$8. \frac{-m}{3} = 2$$

$$9. \frac{3}{4}t = \frac{2}{3}$$

$$10. \frac{2}{3} = -\frac{3}{5}t$$

$$11. \frac{-5}{6}x = \frac{3}{4}$$

$$12. \frac{3}{4}x = \frac{1}{2}$$

$$13. 2y - \frac{3}{5} = \frac{1}{2}$$

$$14. y - \frac{2}{5} = -\frac{1}{3}$$

$$15. \frac{1}{4} + \frac{1}{2}t = 4$$

$$16. \frac{1}{4}x + x = -3 + \frac{1}{2}x$$

$$17. \frac{1}{3} + 2m = m - \frac{3}{2}$$

$$18. m + \frac{2}{3} = \frac{1}{4}m - 1$$

$$19. \frac{2}{5}(x - 2) = -3$$

$$20. \frac{3}{4}(2x + 1) = 2$$

$$21. \frac{2}{3}(3x + 1) = 5$$

$$22. \frac{1}{2} + \frac{2}{5}t - 1 = \frac{1}{5}t + t$$

$$23. \frac{1}{5}m + \frac{2}{3} - 2 = m - \frac{2}{5}$$

$$24. -\frac{1}{4}w - 3 = w + \frac{1}{3}$$

$$25. 3.5X + 0.8 = 18.24 - 5.9X$$

$$26. 0.3X - 0.24 = 0.36 + .52X$$