

UNIT 6 EQUATIONS

6-0 Solving One-Step Equations Notes

One-Step Equations
“Undo” Order of Operations
Solve
Undo Addition or
Subtraction

1. $a + 2 = 8$

2. $y - 5 = 13$

3. $2y = -12$

Solve
Undo Multiplication or
Division

4. $\frac{c}{4} = 14$

5. $x + 9.2 = 10$

6. $2.5x = 10$

$$7. x - \frac{1}{2} = \frac{5}{6}$$

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

8 Steps to Solve Word Problems.

1. Read the Problem
2. Identify the Question
3. Use a Variable to represent the unknown.
4. Draw a picture or chart.
5. Write an Equation.
6. Solve the Equation.
7. Check your work.
8. Write Answer in a complete sentence.

YOU MUST SHOW

VESA

Variable – define a variable

Equation – write an equation

Solve – solve the equation & check

Answer – write your answer in a complete sentence.

9. If a number is half that number, then the result is 8. What is the number?

10. If a number is 7 more than a number then it is equal to 12. What is the number?

11. If a number is doubled, then it is equal to 26. What is the number?

6-1 Solving Two-Step Equations Notes

Two-Step Equations

“Undo” Order of Operations

1. Isolate the Variable
Undo Addition or
Subtraction
2. Solve
Undo Multiplication or
Division

Remember you can...

Clear Fractions – multiply by the LCD

Clear Decimals – multiply by 10,
100...

1. $6a - 2 = 8$

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

3. $-y + 7 = -12$

4. $\frac{c}{4} + 7 = 14$

5. $0.4x + 9.2 = 10$

8 Steps to Solve Word Problems.

1. Read the Problem
2. Identify the Question
3. Use a Variable to represent the unknown.
4. Draw a picture or chart.
5. Write an Equation.
6. Solve the Equation.
7. Check your work.
8. Write Answer in a complete sentence.

YOU MUST SHOW

VESA

Variable – define a variable

Equation – write an equation

Solve – solve the equation & check

AnsWER – write your answer in a complete sentence.

6. You need to build a rectangular pen in your back yard for your dog. One side of the pen will be against the house. Two sides of the pen have a length of x ft and the width will be 25 ft. What is the greatest length the pen can be if you have 63 ft of fencing?

7. A 48 ft wire is cut into three pieces. The second piece is three times as long as the first piece. The third piece is four times as long as the second piece. How long is each piece?

8. The sum of four consecutive odd integers are 96. What are the integers?

6-2 Solving Multi-Step Equations

4 Step to Solve Multi-Step Equations

1. Distribute
Clear Fractions and Decimals
2. Combine Like Terms
3. Isolate the Variable
Undo + & -
4. Solve for the Variable
Undo \cdot & \div

1. $3a + 6 + a = 90$

2. $2(x - 3) = 8$

3. $15 = 9 - 3(x - 1)$

4. $-7(3x - 9) - 2(x - 4) = 14$

5. $4(2x - 8) - (3x + 7) = 10$

6-3 Solving Multi-Step Equations with Fractions & Decimals

Fraction Bust!!

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

2. $\frac{3x}{2} + \frac{x}{5} = 17$

3. $\frac{2}{3} + y = \frac{3}{4}$

Decimal Bust!

4. $0.11m + 1.5 = 2.49$

5. $0.25x + 0.1x = 9.8$

6. You order light bulbs from a catalog. Light bulbs cost \$0.90 each. The shipping charge is \$2.50. If you have \$18.50 to spend, how many light bulbs can you order?

7. If a number is subtracted from five times that number, the result is 6 more than twice that number. What is the number?

6-4 Solving Equations with Variables on Both Sides

Solving Equations

1. Distribute
2. Combine Like Terms
3. Isolate the Variable
- Get variables on one side
4. Solve for the variable

Examples

1. $6k - 3 = 2k + 13$

2. $\frac{2}{5}n - 9 = 7 - \frac{3}{5}n$

3. $8 - \frac{1}{2}p = \frac{1}{4}p - 7$

4. $8 - 2(t + 1) = -3t + 1$

5. $8x - 5(2 + x) = 2(x + 1)$

Solutions

-One Solution

$$x = -14$$

-No Solution

(false statement)

$$7 = -3$$

-All Real Numbers

(true statement)

$$5 = 5$$

$$6. 5x - 7 = 5(x - 2) + 3$$

$$7. 2.5y - .5y = 3.5 + 2y$$

$$8. \frac{1}{3}(3x - 9) + \frac{1}{2}(x - 4) = 4$$

$$9. \frac{2}{3}(2x + 1) = \frac{2}{5}(x - 2)$$

6-5 Ratio and Proportion

Ratio

A comparison of two numbers by division

Proportion

- Two equal ratios
- Could use cross products to solve them
- Could multiply the LCM to both sides.

Solve each proportion:

1.

$$\frac{0.1}{2} = \frac{x}{8}$$

2.

$$\frac{3}{7} = \frac{x+2}{x}$$

3.

$$\frac{z+3}{4} = \frac{z-4}{6}$$

4. According to the scale on a road map, 3 inches represents 40 miles. If two cities measure 10 inches apart on the map, how many miles apart are they?

6-6 Transforming Formulas

Solving Equations

5. Circle the variable you are solving for
6. “Undo” order of operations

1. $x + 45z = 90$, solve for x

2. $xy + 9 = z$, solve for x

3. $7x + 3y = m$, solve for x

4. $\frac{2}{3}y + k = j$

5. $-2(3x - y) = 7$

6-7 Perimeter Word Problems

Draw a picture then use VESA to solve.

VESA

Variable – define a variable

Equation – write an equation

Solve – solve the equation &
check

Answer – write your answer in a complete sentence.

1. The length of a rectangle is 3 in less than its width. The perimeter of the rectangle is 26 in. What is the width of the rectangle?

2. The width of a rectangle is 3yds more than twice the length. If the perimeter is 36 yds, find the dimensions of the rectangle.

3. If the perimeter of an equilateral triangle is 81 inches, find a side of the triangle.

4. Each of the equal sides of an isosceles triangle is twice the third side. The perimeter of the triangle is 175 inches. Find the sides of the triangle.

6-8 Consecutive Integer Word Problems

Consecutive – in order

Ex: 1, 2, 3...

1. The sum of two consecutive integers is -21 . Find the integers.

Consecutive Odd – Odd integers in order

Ex: 1, 3, 5...

2. The sum of three consecutive odd integers is 159. Find the integers.

3. The sum of three consecutive even integers is -60 . Find the integers.

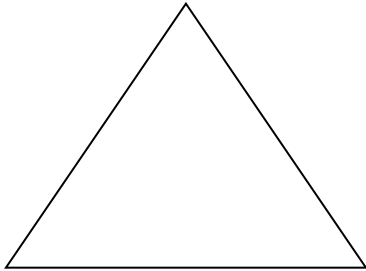
Consecutive Even – Even integers in order

Ex: 2, 4, 6

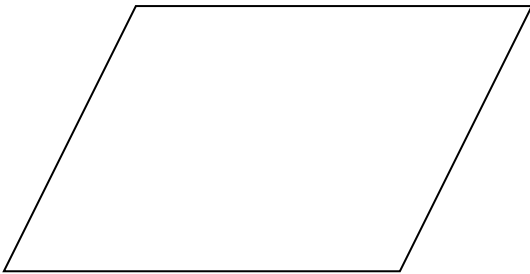
4. Twice the larger of two consecutive integers is equal to twenty-four less than four times the smaller. Find the integers.

6-9 Geometry Word Problems

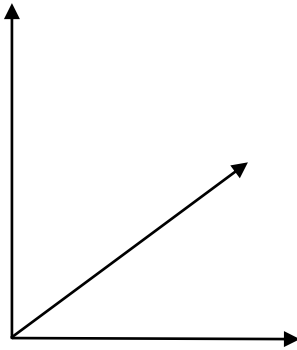
Triangle – Angles add up to 180°



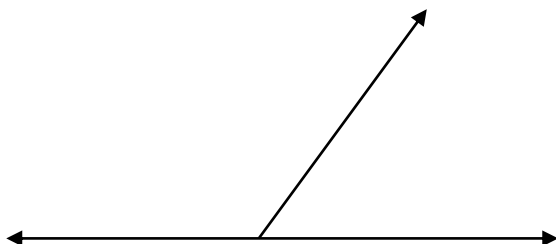
Quadrilateral – Angles add up to 360°



Complimentary Angles – The sum is 90°



Supplementary Angles – The sum is 180°



Examples

1. One of the congruent angles of an isosceles triangle measures 37° . Find the measures of the other angles.

2. One angle of a quadrilateral is 60° . The other three angles are consecutive even integers. Find the measure of the other three angles.

3. An angle measures 42° less than its complement. Find the measure of each angle.

4. The measure of an angle is 20° less than three times its supplement. Find the measure of each angle.