

Geometry

Unit: Quadrilaterals and Polygons

Flashcard: Properties of Parallelograms

Directions: Answer the following questions.

1. Find the value of x and y in the parallelogram below. One diagonal has half labeled 5 and the other half labeled 15. The other diagonal has one half labeled $2x$ minus 6 and the other half labeled 10.
2. Find the value of x and y in the parallelogram below. Angle A is 64 degrees and angle D is $4y$ minus 2 degrees. Side AB is $3x$ minus 6 and side DC is $2x$ plus 8.
3. Find the value of x and y in the parallelogram below. The top side is 24 and the bottom side is $16x$ plus y . The left side is 15 and the right side is $2y$ minus x .
4. In parallelogram ABCD, the measure of angle A = 69° , line segment AB equals 18 cm and line segment BC equals 11.5 cm. Find the measure of angle C.
5. Find the coordinates of the intersection of the diagonals of parallelogram WXYZ with the following vertices: W(-5, 4), X(3, 4), Y(1, -3) and Z(-7, -3)

Answers:

1. Diagonals of a parallelogram bisect each other.

$$5y = 15$$

$$y = 3$$

$$2x - 6 = 10$$

$$2x = 16$$

$$x = 8$$

2. Opposite sides of a parallelogram are congruent

$$3x - 6 = 2x + 8$$

$$x - 6 = 8$$

$$x = 14$$

Consecutive angles of a parallelogram are supplementary.

$$64 + 4y - 2 = 180$$

$$62 + 4y = 180$$

$$4y = 118$$

$$y = 29.5$$

3. Opposite sides of a parallelogram are congruent.

$$y + 16x = 24$$

$$2y - x = 15$$

Solve the system of equations:

$$y = 24 - 16x$$

$$2(24 - 16x) - x = 15$$

$$48 - 32x - x = 15$$

$$48 - 33x = 15$$

$$-33x = -33$$

$$x = 1$$

$$y = 24 - 16(1)$$

$$y = 8$$

$$x = 1 \text{ and } y = 8$$

4. The measure of angle C is equal to the measure of angle A.

$$\text{Angle C} = 69^\circ$$

5. Diagonals of a parallelogram bisect each other. Find the midpoint of the diagonals to find the intersection point.

Midpoint of segment WY:

The x-coordinate is the quantity negative 5 plus 1 divided by 2 and the y-coordinate is 4 plus negative 3 divided by 2. This equals negative 2, 0.5.

Midpoint of segment ZX:

The x-coordinate is the quantity 3 plus negative 7 divided by 2 and the y-coordinate is 4 plus negative 3 divided by 2. This equals negative 2, 0.5.