LESSON MAKER PRO

Parallelogram Power Moves

Use side, angle, and diagonal facts to solve.

HIGH SCHOOL · MA.912.GR.1.4

MA.912.GR.1.4 "Prove relationships and theorems about parallelograms. Solve mathematical and real-world problems involving postulates, relationships and theorems of parallelograms."

NAME _____ DATE _____

PARALLELOGRAM FACTS

In a parallelogram, opposite sides and opposite angles have equal measures. Consecutive angles add to 180 degrees, and the diagonals bisect each other. Use these facts to write an equation, then solve for the unknown.

WORKED EXAMPLE

In parallelogram RSTU, RS = 17x + 19 and TU = 274. Find x.

1. Opposite sides are equal, so 17x + 19 = 274.
2. Subtract 19: 17x = 255.
3. Divide by 17: x = 15.

Answer: x = 15

PRACTICE 6 problems

1 In parallelogram ABCD, AB = 5x - 6 and CD = 29. Find x.

ANSWER _____

2 In parallelogram EFGH, m angle E = 68 degrees. Find m angle F.

ANSWER _____

3 The diagonals of parallelogram JKLM intersect at N. If JN = 3x + 1 and NL = 25, find x.

ANSWER _____

4 In parallelogram ABCD, m angle C = 8x + 7 degrees and m angle D = 2x + 13 degrees. Find x.

ANSWER _____

5 A parallelogram has side lengths 2x + 9 and x + 14. Its perimeter is 106. Find x.

ANSWER _____

6 The diagonals of parallelogram PQRS intersect at T. If PR = 78, find PT.

ANSWER _____

APPLY IT Show your work

1 The student council orders a parallelogram-shaped frame for a dance backdrop. Its adjacent side lengths are 5x + 6 inches and x + 12 inches, and its perimeter is 132 inches. Find x and both side lengths.

WORK SPACE

ANSWER _____

2 A game design student makes a slanted tile shaped like a parallelogram. Two consecutive interior angles measure 7x + 9 degrees and 5x + 27 degrees. Find x and the measure of each angle.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

In parallelogram WXYZ, diagonals WY and XZ intersect at E. WE = 5x - 7, EY = 2x + 20, and XE = x + 16. Find x, WY, and XZ.

_____

_____

ANSWER KEY

Parallelogram Power Moves

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	In parallelogram ABCD, AB = 5x - 6 and CD = 29. Find x.	**x = 7**
2	In parallelogram EFGH, m angle E = 68 degrees. Find m angle F.	**112 degrees**
3	The diagonals of parallelogram JKLM intersect at N. If JN = 3x + 1 and NL = 25, find x.	**x = 8**
4	In parallelogram ABCD, m angle C = 8x + 7 degrees and m angle D = 2x + 13 degrees. Find x.	**x = 16**
5	A parallelogram has side lengths 2x + 9 and x + 14. Its perimeter is 106. Find x.	**x = 10**
6	The diagonals of parallelogram PQRS intersect at T. If PR = 78, find PT.	**PT = 39**

PART 2 · APPLY IT

1. **x = 8; the side lengths are 46 inches and 20 inches.** Use P = 2[(5x + 6) + (x + 12)] to get x = 8, then substitute 8 into both side expressions.
2. **x = 12; the angles measure 93 degrees and 87 degrees.** Set the consecutive angles equal to 180 degrees: (7x + 9) + (5x + 27) = 180.

CHALLENGE

x = 9; WY = 76; XZ = 50

Accept equivalent algebraic work and correctly labeled measures. For diagonal items, require use of the fact that each diagonal is bisected.