

Solutions for Class 9 Maths Chapter 14 Quadrilaterals

Exercise 14.2

Question 1: Two opposite angles of a parallelogram are $(3x - 2)^\circ$ and $(50 - x)^\circ$. Find the measure of each angle of the parallelogram.

Solution:

Given: Two opposite angles of a parallelogram are $(3x - 2)^\circ$ and $(50 - x)^\circ$.

We know, opposite sides of a parallelogram are equal.

$$(3x - 2)^\circ = (50 - x)^\circ$$

$$3x + x = 50 + 2$$

$$4x = 52$$

$$x = 13$$

Angle x is 13°

Therefore,

$$(3x-2)^\circ = (3(13) - 2) = 37^\circ$$

$$(50-x)^\circ = (50 - 13) = 37^\circ$$

Adjacent angles of a parallelogram are supplementary.

$$x + 37 = 180^\circ$$

$$x = 180^\circ - 37^\circ = 143^\circ$$

Therefore, required angles are : 37° , 143° , 37° and 143° .

Question 2: If an angle of a parallelogram is two-third of its adjacent angle, find the angles of the parallelogram.

Solution:

Let the measure of the angle be x . Therefore, measure of the adjacent angle is $2x/3$.

We know, adjacent angle of a parallelogram is supplementary.

$$x + 2x/3 = 180^\circ$$

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$$3x + 2x = 540^\circ$$

$$5x = 540^\circ$$

$$\text{or } x = 108^\circ$$

Measure of second angle is $2x/3 = 2(108^\circ)/3 = 72^\circ$

Similarly measure of 3rd and 4th angles are 108° and 72°

Hence, four angles are $108^\circ, 72^\circ, 108^\circ, 72^\circ$

Question 3: Find the measure of all the angles of a parallelogram, if one angle is 24° less than twice the smallest angle.

Solution:

Given: One angle of a parallelogram is 24° less than twice the smallest angle.

Let x be the smallest angle, then

$$x + 2x - 24^\circ = 180^\circ$$

$$3x - 24^\circ = 180^\circ$$

$$3x = 180^\circ + 24^\circ$$

$$3x = 204^\circ$$

$$x = 204^\circ/3 = 68^\circ$$

$$\text{So, } x = 68^\circ$$

$$\text{Another angle} = 2x - 24^\circ = 2(68^\circ) - 24^\circ = 112^\circ$$

Hence, four angles are $68^\circ, 112^\circ, 68^\circ, 112^\circ$.

Question 4: The perimeter of a parallelogram is 22cm. If the longer side measures 6.5cm what is the measure of the shorter side?

Solution:

Let x be the shorter side of a parallelogram.

$$\text{Perimeter} = 22 \text{ cm}$$

$$\text{Longer side} = 6.5 \text{ cm}$$

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Perimeter = Sum of all sides = $x + 6.5 + 6.5 + x$

$$22 = 2(x + 6.5)$$

$$11 = x + 6.5$$

$$\text{or } x = 11 - 6.5 = 4.5$$

Therefore, shorter side of a parallelogram is 4.5 cm