RS Aggarwal Solutions for Class 8 Maths Chapter 16 Exercise 16.1: The Physics Wallah academic team has provided a comprehensive answer for Chapter 16 Parallelograms in the RS Aggarwal class 8 textbook. Before examining the Chapter sixteen parallelogram solution, before attempting to solve all of the numerical problems in Exercise-16A, it is necessary to have a thorough understanding of Chapter 16 Parallelograms.

To do this, read the theory of Chapter 16 Parallelograms. Use NCERT solutions to help you tackle class 8 questions and get good grades. For Maths class 8, Physics Walla expert posted NCERT solutions.

RS Aggarwal Solutions for Class 8 Maths Chapter 16 Exercise 16.1 Parallelograms Overview

Exercise 16.1 in Chapter 16 of RS Aggarwal's Class 8 Maths book delves into the fascinating world of parallelograms, a fundamental concept in geometry. This exercise begins by defining parallelograms as quadrilaterals with opposite sides that are both parallel and equal in length. It explores key properties of parallelograms, such as the equality of opposite angles and the fact that consecutive angles are supplementary.

The exercise presents various problems that require students to apply these properties to solve for unknown sides and angles, reinforcing their understanding of parallelogram characteristics. Additionally, students learn to differentiate parallelograms from other quadrilaterals, such as rectangles and rhombuses, based on specific criteria like angles and side lengths.

RS Aggarwal Solutions for Class 8 Maths Chapter 16 Exercise 16.1 (Ex 16A)

Below we have provided RS Aggarwal Solutions for Class 8 Maths Chapter 16 Exercise 16.1 Parallelograms –

(1) ABCD is parallelogram in which $\angle A = 110^o$. Find the measure of each of the angles $\angle B$, $\angle C$ and $\angle D$.

Solution: It is a given that ABCD is a parallelogram in which $\angle A = 110^o$. Since, the sum of any two adjacent angles of a parallelogram is 180^o, we have

$\angle A + \angle B = 180^o$

$\Rightarrow \angle B = 180^o - 110^o$

$\Rightarrow \angle B = 70^o$

Also, $\angle B + \angle C = 180^o$

$\Rightarrow \angle C = 180^o - 70^o$

$\Rightarrow \angle C = 110^o$

Further, $\angle C + \angle D = 180^o$

$\Rightarrow \angle D = 180^o - 110^o$

$\Rightarrow \angle D = 70^o$

$\therefore \angle B = 70^o$, $\angle C = 110^o$ and $\angle D = 70^o$.

(2) Two adjacent angles of a parallelogram are equal. What is the measure of each of these angles?

Solution: Let the measure of each equal angle be x^o.

$\therefore x + x = 180^o$

$\Rightarrow 2x = 180$

$\Rightarrow x = 90$

Hence, the measure of each angle is 90^o.

(3) Two adjacent angles of a parallelogram are in the ratio 4 : 5. Find the measure of each of its angles.

Solution: Let the measure of the adjacent angles be 4x and 5x

$\therefore 4x + 5x = 180$

$\Rightarrow 9x = 180$

$\Rightarrow x = 20$

Therefore the measure of the required angle is

$\angle A = 4 \times 20 = 80^o$

$\angle B = 5 \times 20 = 100^o$

$\angle B + \angle C = 180^o$

$\Rightarrow \angle C = 180^o - 100^o = 80^o$

$\angle C + \angle D = 180^o$

$\Rightarrow \angle D = 180^o - 80^o = 100^o$

(4) Two adjacent angles of a parallelogram are $(3x - 4)^o$ and $(3x + 16)^o$. Find the value of x and hence find the measure of each angles.

Solution: $(3x - 4) + (3x + 16) = 180$

$\Rightarrow 3x - 4 + 3x + 16 = 180$

$\Rightarrow 6x + 12 = 180$

$\Rightarrow 6x = 180 - 12$

$\Rightarrow 6x = 168$

$\Rightarrow x = 28$

Therefore, the measure of the each angle is

$\angle A = (3\times 28 - 4) = 80^o$

$\angle B = (3\times 28 + 16) = 100^o$

(5) The sum of two opposite angles of a parallelogram is 130^o. Find the measure of each of its angles.

Solution: $\angle A + \angle C = 130$

Let the measure of $\angle A = \angle C = x$

$\therefore 2x = 130$

$\Rightarrow x = 65$

Therefore, $\angle A = 65$

$\therefore \angle A + \angle B = 180$

$\Rightarrow \angle B = 180 - 65$

$\Rightarrow \angle B = 115$

$\angle C = 65$

$\therefore \angle C + \angle D = 180$

$\Rightarrow \angle D = 180 - 65$

$\Rightarrow \angle D = 115.$

(6) Two sides of a parallelogram are in the ratio 5 : 3. If its perimeter is 64 cm, find the lengths of its sides.

Solution: Let the measure of the sides be 5x and 3x.

Its perimeter = 2(5x + 3x)

$\therefore$ 2(5x + 3x) = 64

$\Rightarrow$ 16x = 64

$\Rightarrow$ x = 4

Therefore, one side = 5 × 4 = 20

Other side = 3 × 4 = 12

(7) The perimeter of a parallelogram is 140 cm. If one of the sides is longer than the other by 10cm, find the length of each of its sides.

Solution: Let the length of one side be x cm and other is (x + 10) cm.

$\therefore$ 2(x + x + 10) = 140

$\Rightarrow$ 4x + 20 = 140

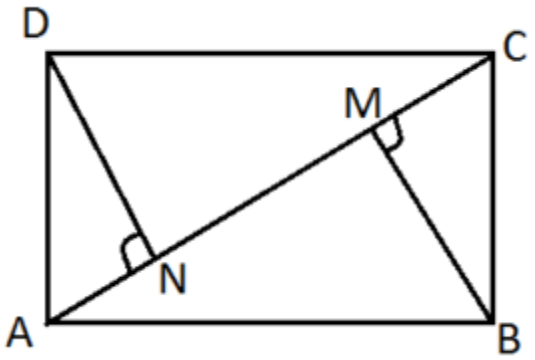
$\Rightarrow$ 4x = 140 – 20

$\Rightarrow$ 4x = 120

$\Rightarrow$ x = 30

Length of one side is 30 cm and other side = (30 + 10) = 40 cm.

(8) In the adjacent figure, ABCD is a rectangle. If BM and DN are perpendiculars from B and D on AC, prove that $\triangle$BMC $\cong$ $\triangle$DNA. Is it true that BM = DN?



Solution: In ∆BMC and ∆DNA:

∠DNA = ∠BMC = 90°

∠BCM = ∠DAN (alternative angles)

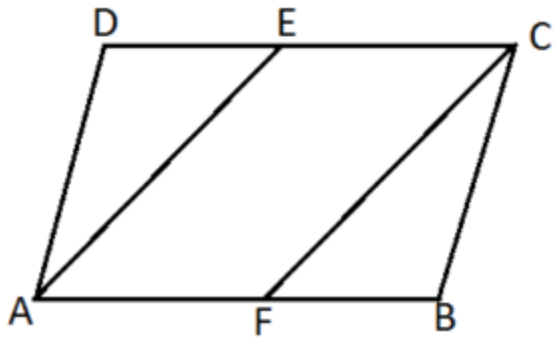
BC = DA (opposite sides)

By AAs congruency criteria:

∆BMC ≅ ∆DNA (proved)

So, we can write BM = DN.

(9) In the adjacent figure, ABCD is a parallelogram and line segments AE and CF bisect the angles A and C respectively. Show that AE // CF.



Solution: In ∆ADE and ∆CBF,

We have AD = BC, ∠B = ∠D and ∠DAE = ∠BCF

∵ ∠A = ∠C

$$\Rightarrow \frac{1}{2}\angle A = \frac{1}{2}\angle C$$

$$\Rightarrow \angle DAE = \angle BCF$$

$$\therefore \Delta ADE \cong \Delta CBF$$

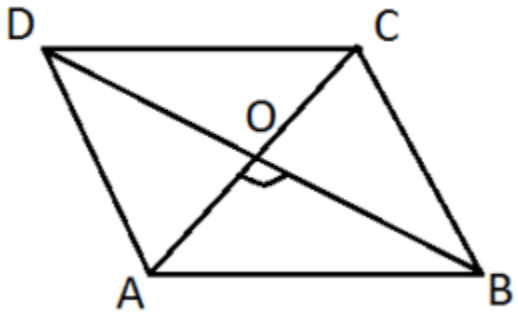
And therefore, CD – DE = AB – BF

So, CE = AF

∴ AECF is a parallelogram.

Hence, AE // CF.

(10) The lengths of the diagonals of a rhombus are 16 cm and 12 cm respectively. Find the length of each of its sides.



Solution: We know that the diagonals of a rhombus bisect each other at right angles. Ac and BD are intersecting at a point O.

$$AO = \frac{1}{2} AC = \left(\frac{1}{2} \times 16\right) = 8 \text{ cm}$$

$$BO = \frac{1}{2} BD = \left(\frac{1}{2} \times 12\right) = 6 \text{ cm}$$

From the right ΔAOB, we have

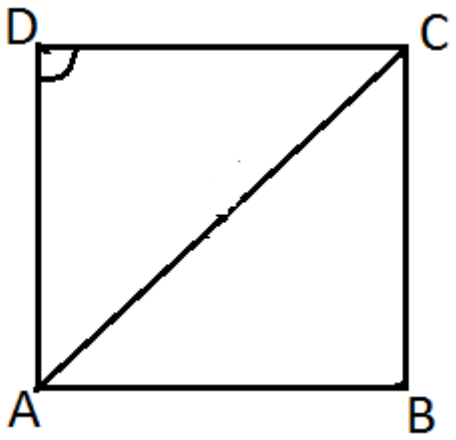
$$\therefore AB^2 = AO^2 + BO^2$$

$$\Rightarrow AB^2 = \{(8)^2 + (6)^2\}\, cm^2$$

$$\Rightarrow AB = \sqrt{100} = 10\, cm$$

Therefore, length of each side is 10 cm. Because all sides of a rhombus are equal.

(11) In the given figure ABCD is square. Find the measure of $\angle$CAD.



Solution: In ΔADC,

DA = DC

$\Rightarrow \angle ACD = \angle DAC = x^o$

Then, $x^o + x^o + 90^o = 180^o$

$\Rightarrow 2x^o = 180^o - 90^o$

$\Rightarrow 2x^o = 90^o$

$\Rightarrow x^o = 45^o$

(12) The sides of a rectangle are in the ratio 5 : 4 and its perimeter is 90 cm. Find its length and breadth.

Solution: Let the length and breadth of the rectangle be 5x and 4x respectively.

$\therefore 2(5x + 4x) = 90$

$\Rightarrow 18x = 90$

$\Rightarrow x = 5$

Length of the rectangle is (5× 5) = 25 cm and breadth = (4 × 5) = 20 cm.

(13) Name each of the following parallelograms.

(i) The diagonals are equal and the adjacent sides are unequal.

Ans: Rectangle.

(ii) The diagonals are equal and the adjacent sides are equal.

Ans: Square.

(iii) The diagonals are unequal and the adjacent sides are equal.

Ans: Rhombus.

(iv) All the sides are equal and one angle is 60^o.

Ans: Rhombus.

(v) All the sides are equal and angle is 90^o.

Ans: Square.

(vi) All the angles are equal and the adjacent sides are unequal.

Ans: Rectangle.

(14) Which of the following statements are true and which are false?

(i) The diagonals of a parallelogram are equal. ⇒ False

(ii) The diagonals of a rectangle are perpendicular to each other. ⇒ False

(iii) The diagonals of a rhombus are equal. ⇒ False

(iv) Every rhombus is a kite. ⇒ False

(v) Every rectangle is square. ⇒ False

(vi) Every square is parallelogram. ⇒ True

(vii) Every square is rhombus. ⇒ True

(viii) Every rectangle is a parallelogram. ⇒ True

(ix) Every parallelogram is rectangle. ⇒ False

(x) Every rhombus is a parallelogram. ⇒ True

Benefits of RS Aggarwal Solutions for Class 8 Maths Chapter 16 Exercise 16.1

The RS Aggarwal Solutions for Class 8 Maths Chapter 16 Exercise 16.1 on Parallelograms provide several benefits for students looking to deepen their understanding of geometry and improve their mathematical skills. Here are some key advantages:

Conceptual Clarity: The solutions offer clear explanations of the properties and characteristics of parallelograms, helping students understand concepts such as parallel sides, equal opposite angles, and supplementary consecutive angles.

Application of Theorems: Students learn to apply important geometric theorems related to parallelograms, such as the Opposite Sides Theorem and the Opposite Angles Theorem, enhancing their problem-solving skills.

Step-by-Step Approach: Each problem is solved step-by-step, allowing students to follow the logical progression of the solution, making it easier to grasp complex concepts and methods.

Strengthening Analytical Skills: The exercise includes a variety of problems that require analytical thinking, enabling students to develop their ability to analyze and solve geometric problems efficiently.

Preparation for Exams: RS Aggarwal Solutions are aligned with the academic curriculum and examination patterns, providing students with practice questions that prepare them for exams and boost their confidence.

Building a Strong Foundation: By understanding parallelograms, students lay a strong foundation for studying more advanced geometric concepts, which will be beneficial in higher-level mathematics.