NCERT Solutions Class 9 Maths
Chapter 6: Lines and Angles
EXERCISE 6.2

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Quick Summary: In NCERT Solutions Class 9 Maths Chapter 6 Exercise 6.2, students learn about pairs of angles and their fundamental properties through practical problems. This exercise covers Linear Pair Axiom, Vertically Opposite Angles Theorem, and angle relationships in parallel lines with transversals, which are essential for building geometric reasoning skills required in CBSE board exams and competitive tests.

Key Takeaways:

- Linear Pair Axiom: If two angles form a linear pair, then their sum is 180°
- Vertically Opposite Angles Theorem: Vertically opposite angles are always equal
- Parallel lines with transversal create equal alternate interior angles and supplementary co-interior angles
- These angle properties are fundamental for solving complex geometry problems in higher classes

Complete Solutions

Question 1

QUESTION

In Fig. 6.23, if AB \parallel CD, CD \parallel EF and y : z = 3 : 7, find x.

SOLUTION

This question tests our understanding of parallel lines, transversal angles, and the properties of ratios. We need to find the value of angle given that , , and the ratio .

Step 1: Establish the relationship between angles and

Since , and a transversal intersects them, angles and are interior angles on the same side of the transversal. Therefore, they are supplementary.

Step 2: Use the given ratio to express and in terms of a common variable

Given , let and for some variable .

Step 3: Substitute these expressions into the equation from Step 1 and solve for

Step 4: Find the values of angles and

Step 5: Establish the relationship between angles and

Since , and a transversal intersects them, angles and are interior angles on the same side of the transversal. Therefore, they are supplementary.

Step 6: Solve for

Final Answer:

ANSWER

126^\circ

Question 2

QUESTION

In Fig. 6.24, if AB \parallel CD, EF \perp CD and \angle GED = 126^\circ, find \angle AGE, \angle GEF and \angle FGE.

SOLUTION

This question tests our understanding of angles formed by parallel lines and transversals, as well as properties of perpendicular lines.

Step 1: Find

Since , and are alternate interior angles. Alternate interior angles are equal when lines are parallel.

Therefore, .

Given that , we have:

Step 2: Find

We know that , which means .

Also, .

We can rearrange this to find :

Substituting the given values:

Step 3: Find

Since , and are supplementary angles (co-interior angles on the same side of the transversal).

Therefore, .

We also know that and form a linear pair with . However, a simpler approach is to consider the triangle . The sum of angles in a triangle is .

Since , and , then is also perpendicular to . Therefore

We already found and .

(Linear Pair)

Final Answer:

, ,

ANSWER

126^\circ, 36^\circ, 54^\circ

Question 3

QUESTION

In Fig. 6.25, if PQ \parallel ST, \angle PQR = 110^\circ and \angle RST = 130^\circ, find \angle QRS.

SOLUTION

This question tests our understanding of angles formed by parallel lines and the properties of interior angles.

Step 1: Draw a line parallel to PQ and ST through point R.

Let's draw a line XY parallel to PQ and ST, passing through point R. This construction will help us relate the given angles to .

Step 2: Use the properties of parallel lines and interior angles.

Since , (because they are interior angles on the same side of the transversal QR).

We are given , so:

Step 3: Apply the same properties to the other set of parallel lines.

Since , (because they are interior angles on the same side of the transversal SR).

We are given , so:

Step 4: Find .

We know that . Therefore,

Therefore, .

Final Answer:

ANSWER

60^\circ

Question 4

QUESTION

In Fig. 6.26, if AB \parallel CD, \angle APQ = 50^\circ and \angle PRD = 127^\circ, find x and y.

SOLUTION

This question tests our understanding of angles formed by parallel lines and transversals, specifically alternate interior angles and exterior angles.

Step 1: Identify the given information

We are given that , , and . We need to find the values of and .

Step 2: Find the value of x

Since and is a transversal, and are alternate interior angles. Therefore, they are equal.

So, .

Step 3: Find the value of y

Since and is a transversal, is an exterior angle and is its corresponding interior angle. We can use the property that an exterior angle is equal to the sum of the two opposite interior angles.

Consider triangle . is an exterior angle to this triangle at vertex .

Therefore, .

We know that , so we can substitute this value into the equation:

Final Answer:

,

ANSWER

x = 50^\circ, y = 77^\circ

Question 5

QUESTION

In Fig. 6.27, PQ and RS are two mirrors placed parallel to each other. A ray AB strikes mirror PQ at B, reflects along BC, then hits mirror RS at C and reflects back along CD. Prove that AB \parallel CD.

SOLUTION

This question tests our understanding of the laws of reflection and properties of parallel lines. We need to prove that the incident ray is parallel to the reflected ray .

Step 1: Draw perpendiculars

Since and are parallel mirrors, draw and . Because both and are perpendicular to parallel lines, .

Step 2: Identify angles of incidence and reflection

Let be the angle of incidence and be the angle of reflection at point . According to the laws of reflection, angle of incidence equals the angle of reflection. Therefore, . Similarly, at point , let be the angle of incidence and be the angle of reflection. Thus, .

Step 3: Use the property of parallel lines and perpendiculars

Since and is a transversal, the alternate interior angles are equal. Therefore, .

Step 4: Combine the angle equalities

We have and , and . Therefore, .

Step 5: Relate angles to prove

Now, consider and . We can write:

and

Since , we can say and . Also, since , we have .

Therefore, . These are alternate interior angles formed by the transversal intersecting lines and . If alternate interior angles are equal, then the lines are parallel.

Step 6: Conclude

Hence, .

ANSWER

Angle of incidence = Angle of reflection. At point B, draw BE \perp PQ and at point C, draw CF \perp RS.

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📐 Key Formulas

Important Formulas for Exercise 6.2

Formula / Concept	Description
Linear Pair of Angles	If a ray stands on a line, then the sum of the two adjacent angles so formed is 180^\circ. These two adjacent angles are called a linear pair.
Linear Pair Axiom	If the sum of two adjacent angles is 180^\circ, then their non-common arms form a straight line.
Vertically Opposite Angles	When two lines intersect each other, the angles that are opposite to each other are called vertically opposite angles.
Vertically Opposite Angles Theorem	If two lines intersect each other, then the vertically opposite angles are equal. For example, if lines AB and CD intersect at point O, then \angle AOC = \angle BOD and \angle AOD = \angle BOC.
Transversal	A line that intersects two or more lines at distinct points is called a transversal.
Corresponding Angles	When a transversal intersects two parallel lines, the pairs of corresponding angles are equal.
Alternate Interior Angles	When a transversal intersects two parallel lines, the pairs of alternate interior angles are equal.
Interior Angles on the Same Side of the Transversal	When a transversal intersects two parallel lines, the pairs of interior angles on the same side of the transversal are supplementary (their sum is 180^\circ). These are also referred to as co-interior angles.

Top FAQs

Q1. How many questions are in NCERT Solutions Class 9 Maths Chapter 6 Lines and Angles Exercise 6.2?

Exercise 6.2 of NCERT Solutions for Class 9 Maths Chapter 6 Lines and Angles contains exactly 5 questions. These questions focus on pairs of angles, Linear Pair Axiom, and Vertically Opposite Angles Theorem. All 5 questions with step by step solutions are available for free PDF download for CBSE board exam 2025-26 preparation.

Q2. Where can I download free PDF of NCERT Solutions for Class 9 Maths Chapter 6 Lines and Angles Exercise 6.2?

You can download the free PDF of NCERT Solutions for Class 9 Maths Chapter 6 Lines and Angles Exercise 6.2 from official NCERT website or trusted educational portals. These step by step solutions are updated as per CBSE syllabus 2025-26 and include detailed explanations of all 5 questions covering Linear Pair Axiom and Vertically Opposite Angles concepts.

Q3. How many marks does Lines and Angles Chapter 6 carry in CBSE Class 9 Maths board exam 2025-26?

Lines and Angles Chapter 6 carries approximately 5 marks in CBSE Class 9 Maths board exam 2025-26 under Unit IV - Geometry. Exercise 6.2 questions on pairs of angles, Linear Pair Axiom, and Vertically Opposite Angles are crucial for scoring these marks. Students should practice NCERT Solutions for Class 9 Maths Chapter 6 Exercise 6.2 thoroughly for complete preparation.

Q4. Which is the most difficult question in Exercise 6.2 of NCERT Solutions Class 9 Maths Chapter 6 Lines and Angles?

Question 5 is generally considered the most difficult in Exercise 6.2 of NCERT Solutions for Class 9 Maths Chapter 6 Lines and Angles as it requires application of both Linear Pair Axiom and Vertically Opposite Angles Theorem together. Students preparing for CBSE board exam 2025-26 should focus on step by step solutions and practice this question multiple times to master the concept.

Q5. What is Linear Pair Axiom explained in NCERT Solutions Class 9 Maths Chapter 6 Lines and Angles Exercise 6.2?

Linear Pair Axiom states that if a ray stands on a line, then the sum of two adjacent angles so formed is 180°. This fundamental concept is extensively covered in NCERT Solutions for Class 9 Maths Chapter 6 Exercise 6.2 with step by step solutions. Understanding Linear Pair Axiom is essential for CBSE board exam 2025-26 as questions worth 2-3 marks are frequently asked from this topic.

More Exercises

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