Important Questions for Class 9 Maths Chapter 5: Chapter 5 of Class 9 Maths, "Introduction to Euclid’s Geometry," focuses on the foundational principles of geometry as laid out by Euclid, the father of geometry. Important topics include Euclid's definitions, axioms, and postulates, particularly the five postulates that serve as the basis for geometric construction.

The chapter also delves into concepts like points, lines, planes, and their relationships. Key questions revolve around understanding and applying Euclid's postulates, proving geometric statements, and differentiating between axioms and theorems. Solving problems based on these fundamental concepts helps in grasping the logical structure of geometry.

Important Questions for Class 9 Maths Chapter 5 Overview

Important Questions for Class 9 Maths Chapter 5 Introduction to Euclid’s Geometry is vital as it sets the groundwork for understanding geometry systematically. The important questions from this chapter often focus on Euclid’s five postulates, definitions, and axioms, asking students to apply these to solve problems or prove basic geometric results.

These questions are important because they help students grasp how logical deduction is used to build the entire structure of geometry. Concepts like points, lines, and planes, and their relationships, are explored through Euclid’s postulates, forming the core of advanced geometric studies. Mastering these questions enhances critical thinking, precision, and reasoning skills, which are essential for tackling more complex geometric principles in higher classes.

Important Questions for Class 9 Maths Chapter 5 Introduction to Euclid’s Geometry

Below is the Important Questions for Class 9 Maths Chapter 5 Introduction to Euclid’s Geometry -

Q.1: What are the five postulates of Euclid’s Geometry?

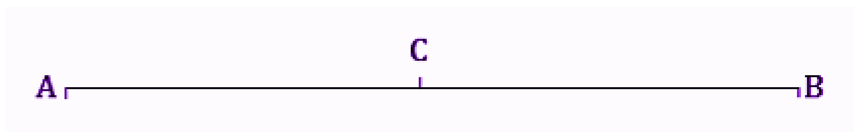
Answer: Euclid’s postulates were:

1. A straight line may be drawn from one point to any other point.
2. A terminated line can be produced indefinitely.
3. A circle can be drawn with any centre and any radius.
4. All right angles are equal to one another.

5. If a straight line falling on two straight lines makes the interior angles on the same side of it taken together less than two right angles, then the two straight lines if produced indefinitely, meet on that side on which the sum of angles is less than two right angles.

Q.2: If a point C lies between two points A and B such that AC = BC, then prove that AC =1/2 AB. Explain by drawing the figure.

Solution:



Given, AC = BC

Now, add AC on both sides.

L.H.S + AC = R.H.S + AC

AC + AC = BC + AC

2AC = BC + AC

Since, we know,

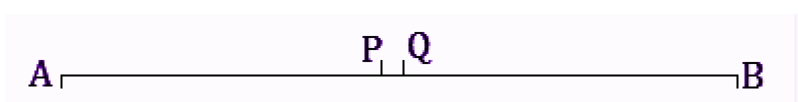
BC +AC = AB (as it coincides with line segment AB, from figure)

∴ 2 AC = AB (If equals are added to equals, the wholes are equal.)

⇒ AC = 1/2 AB.

Q.3: If in Q.2, point C is called a mid-point of line segment AB. Prove that every line segment has one and only one mid-point.

Solution:



Let, AB be the line segment

Assume that points P and Q are the two different midpoints of AB.

Therefore,

AP=PB ………(1)

and AQ = QB …..(2)

Also,

PB + AP = AB (as it coincides with line segment AB)

Similarly, QB + AQ = AB.

Now,

Adding AP to the L.H.S and R.H.S of the equation (1)

We get, AP + AP = PB + AP (If equals are added to equals, the wholes are equal.)

⇒ 2 AP = AB — (3)

Similarly,

2 AQ = AB — (4)

From (3) and (4),

2 AP = 2 AQ

⇒ AP = AQ

Thus, we conclude that P and Q are the same points.

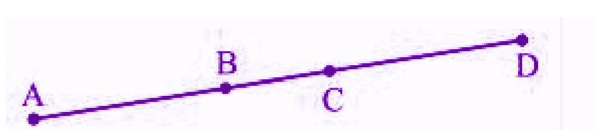
This contradicts our assumption that P and Q are two different midpoints of AB.

Thus, it is proved that every line segment has one and only one mid-point.

Hence Proved.

Q.4: In the given figure, if AC = BD, then prove that AB = CD.

Solution:



It is given, AC = BD

From the given figure, we get,

AC = AB + BC

BD = BC + CD

⇒ AB + BC = BC + CD [Given: AC=BD]

We know that, according to Euclid's axiom, when equals are subtracted from equals, remainders are also equal.

Subtracting BC from the L.H.S and R.H.S of the equation AB + BC = BC + CD, we get,

AB + BC – BC = BC + CD – BC

AB = CD

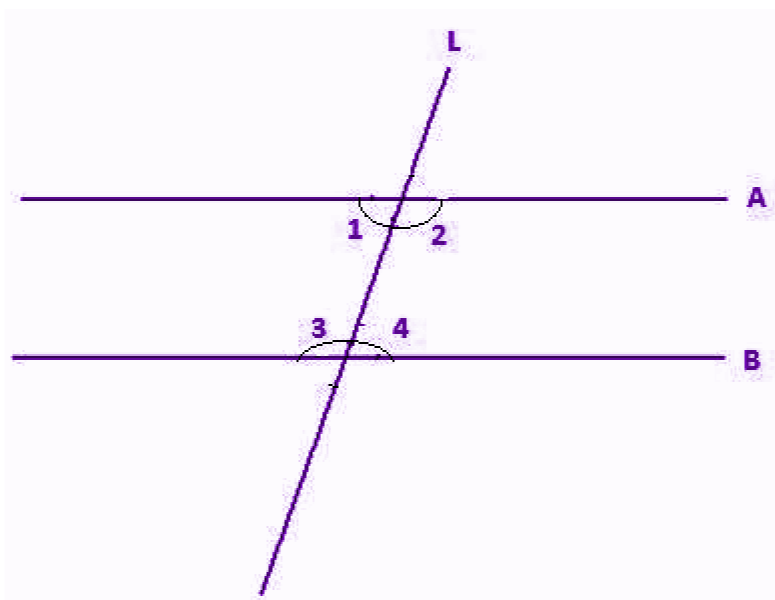
Hence proved.

Q.5: Does Euclid's fifth postulate imply the existence of parallel lines? Explain.

Solution:

Yes, Euclid's fifth postulate does imply the existence of the parallel lines.

If the sum of the interior angles is equal to the sum of the right angles, then the two lines will not meet each other at any given point, hence making them parallel to each other.



So,

$\angle 1 + \angle 2 = 180°$

Or $\angle 3 + \angle 4 = 180°$

Q.6: It is known that $x + y = 10$ and that $x = z$. Show that $z + y = 10$.

Solution:

According to the question,

We have,

$x+y=10$ …(i)

And, $x=z$ …(ii)

Applying Euclid's axiom,

"if equals are added to equals, the wholes are equal"

We get,

From Eq. (i) and (ii)

$x+y=z+y$ ….(iii)

From Eqs. (i) and (iii)

$z+y=10$

Q7. Two salesmen make equal sales during the month of August. In September, each salesmen doubles his sale of the month of August. Compare their sales in September.

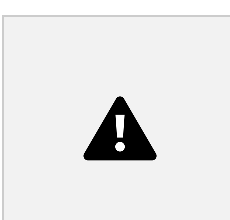
Solution: Let the equal sales of two salesmen in August be y. In September, each salesman doubles his sale of August.

Thus, sale of first salesman is 2y and sale of second salesman is 2y.

According to Euclid's axioms, things which are double of the same things are equal to one another.

So, in September their sales are again equal.

Q8. In the given figure, we have AB = BC, BX = BY. Show that AX = CY.



Solution: Given, AB = BC …(i)

and BX = BY …(ii)

On subtracting (ii) from (i), we get AB – BX = BC – BY

[∵ If equals are subtracted from equals, the remainders are equal]

∴ AX = CY

Q9. Look at the given figure. Show that length AH > sum of lengths of AB + BC + CD.

Solution:

From the given figure, we have

AB + BC + CD = AD

[AB, BC and CD are the parts of AD]

Since, AD is also the part of AH.

AH > AD [∵ The whole is greater than the part]

So, length AH > sum of lengths of AB + BC + CD.

Benefits of Solving Important Questions for Class 9 Maths Chapter 5 Introduction to Euclid’s Geometry

Below we have provided some of the benefits of solving Important Questions for Class 9 Maths Chapter 5 Introduction to Euclid’s Geometry -

Strong Foundation in Geometry:

Helps students build a solid understanding of the basic principles of geometry, such as points, lines, and planes, which are essential for future studies in mathematics.

Clear Understanding of Euclid’s Postulates:

By solving questions, students can thoroughly understand Euclid's five postulates, which are the foundation of geometric constructions and proofs.

Development of Logical Reasoning:

Solving problems based on axioms and theorems helps sharpen logical thinking and deduction skills, essential for proving geometric statements.

Improved Problem-Solving Skills:

Working through various problems improves a student’s ability to approach and solve geometry questions in a structured and logical manner.

Boosts Conceptual Clarity:

By practicing important questions, students gain clarity in the distinction between axioms, postulates, and theorems, enhancing their overall understanding of the subject.