

MATHEMATICS

CHAPTER NUMBER :~ 5

CHAPTER NAME :~ INTRODUCTION TO EUCLID'S GEOMETRY

SUB TOPIC :~ RECAPITULATION

CHANGING YOUR TOMORROW

PREVIOUS KNOWLEDGE TEST

1. Give a definition of line segment. Are there other terms that need to be defined first? What are they and how might you define them ?
2. Solve the equation $a - 15 = 25$ and state which axiom do you use here.

LEARNING OUTCOME:~

1. Students will be able to learn Euclid's definitions, axioms and postulates and solve problems.
2. Students will be able to learn the equivalent version of Euclid's 5th postulate.

Consider two ‘postulates’ given below

(i) Given any two distinct points A and B, there exists a third point C which is in between A and B.

(ii) There exist atleast three points that are not on the same line.

Do these postulates contain any undefined terms? Are these postulates consistent? Do they follow from Euclid’s postulates? Explain.

Solution:

Yes, these postulates contain undefined terms such as 'Point and Line'. Also, these postulates are consistent because they deal with two different situations as

- (i) says that given two points A and B, there is a point C lying on the line in between them.
- (ii) says that, given points A and B, you can take point C not lying on the line through A and B.

No, these postulates do not follow from Euclid's postulates, however they follow from the axiom, "Given two distinct points, there is a unique line that passes through them."

If a point C lies between two points A and B such that $AC = BC$, then prove that $AC = \frac{1}{2} AB$, explain by drawing the figure.

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

Solution:

Yes. If a straight line l falls on two lines m and n such that sum of the interior angles on one side of l is two right angles, then by Euclid's fifth postulate, lines m and n will not meet on this side of l . Also, we know that the sum of the interior angles on the other side of the line l will be two right angles too. Thus, they will not meet on the other side also.

Evaluation:-

1. Ram and Ravi have the same weight. If they each gain weight by 2 kg, how will their new weights be compared ?
2. If a point C be the mid-point of a line segment AB, then write the relation among AC, BC and AB.

Question 5.

Ram and Ravi have the same weight. If they each gain weight by 2 kg, how will their new weights be compared ?

Solution:

Let x kg be the weight each of Ram and Ravi.

On adding 2 kg,

Weight of Ram and Ravi will be $(x + 2)$ kg each.

According to Euclid's second axiom, when equals are added to equals, the wholes are equal.

So, weight of Ram and Ravi are again equal.

Question 6.

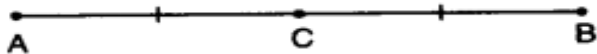
If a point C be the mid-point of a line segment AB, then write the relation among AC, BC and AB.

Solution:

Here, C is the mid-point of AB

$$\Rightarrow AC = BC$$

$$\Rightarrow AC = BC = \frac{1}{2}AB$$



HOMEWORK ASSIGNMENT:-

EXERCISE – 5.1 AND 5.2 PRACTICE

AHA

How would you rewrite Euclid's fifth postulate so that it would be easier to understand?

THANKING YOU
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