



**MATHS**

**NCERT - NCERT**

**MATHEMATICS(ENGLISH)**

**INTRODUCTION TO EUCLIDS**

**GEOMETRY**

**Solved Examples**

1. Prove that an equilateral triangle can be constructed on any given line segment.



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2. Consider the following statement: There exists a pair of straight lines that are everywhere equidistant from one another. Is this statement a direct consequence of Euclid's fifth postulate? Explain.



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3. If A, B and C are three points on a line, and B lies between A and C then prove that  $AB + BC = AC$ .



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## Exercise 5 2

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



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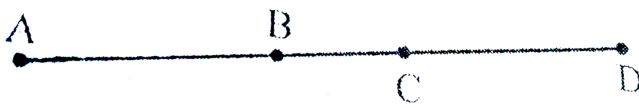
2. How would you rewrite Euclid's fifth postulate so that it would be easier to understand?



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## Exercise 5 1

1. In Fig. 5.10, if  $AC = BD$ , then prove that  $AB = CD$ .



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2. Why is Axiom 5, in the list of Euclid's axioms, considered a 'universal truth'? (Note that the question is not about the fifth postulate.)



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3. 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.



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4. Prove that every line segment has one and only one mid-point.

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5. Give a definition for each of the following terms. Are there other terms that need to be defined first? What are they, and how might you define them? (i) parallel lines (ii) perpendicular lines (iii) line segment (iv) radius of a circle (v) square.



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6. 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 at least 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.



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7. Which of the following statements are true and which are false? Give reasons for your answers.



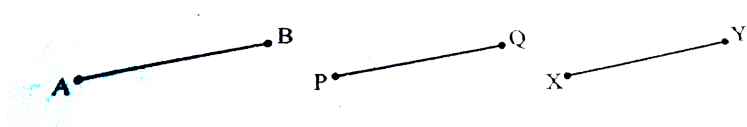
(i) Only one line can pass through a single point.

(ii) There are an infinite number of lines which pass through two distinct points.

(iii) A terminated line can be produced indefinitely on both the sides.

(iv) If two circles are equal, then their radii are equal.

(v) In Fig. 5.9, if  $AB = PQ$  and  $PQ = XY$ , then  $AB = XY$ .



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