**CRITIRCAL AND CREATIVE THINKING ITEMS**

**CLASS IX : CHAPTER 5 : INTRODUCTION TO EUCLID GEOMETRY**

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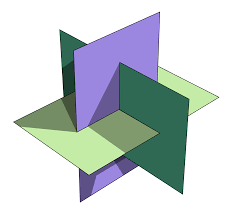
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| **S.No.** | **Theme of the item** |
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**EUCLID’S GEOMETRY QUESTIONS CLASS IX**

**TEST ITEM 1 CURVES AND LINES**

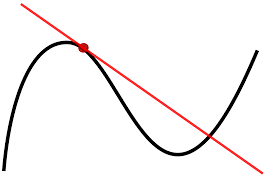
**Plane**

A plane is a 2-dimensional figure which we can extend infinitely and is flat. Therefore, the Plane includes 2D figures like quadrilaterals, triangles and includes areas and perimeters.



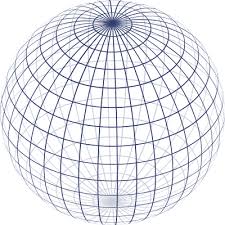
**Curve**

A curve is a 1-dimensional entity which can be a straight line or a curved entity. In other words, a curve is a one-dimensional mathematical entity that may be straight or not! Hence, every line – straight or not can be a curve.



**Surface**

A surface is a 2D or a 3D construction in space or a plane with no thickness. Therefore, we use it in the calculation of surface area.



* 1. Which of the following are the boundaries of a surface?

(a)Lines (b) curves (c) surfaces (d) points

(i)a and b (ii) a and c (iii) b and c (iv) c and d

1.2 A curve which has 2 end points is called …………………

A) Open Curve      B) Closed Curve        C) Simple Curve       D) None of the Above

1.3 Encircle the correct answer:

|  |  |
| --- | --- |
| STATEMENT | CORRECT / INCORRECT |
| (i)In Euclid’s Geometry,point, line and plane are undefined terms. | CORRECT / INCORRECT |
| (ii)Two lines drawn in a plane always intersect at a point. | CORRECT / INCORRECT |

**TEST ITEM 2 ROW HOUSES**



Three friends Jeniee, Maggie and Sam live in the houses which are in one row. Jeniee lives in the first house,Maggie in the fifth house and Sam in the ninth house.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **J** |  |  |  | **M** |  |  |  | **S** |

**Jeniee Maggie Sam**

* 1. If all the houses are alike and if JM = MS then what is the relation between JM and JS?

1. JM = JS (b) JM = JS (c) JM = JS (d) none of these.
   1. When all the houses lie in a row, what do you call them ?
2. Coplanar (b) coincident (c) concurrent (d) collinear

(i) a and c (ii) a and d (iii) b and c (iv) c and d

* 1. A new friend Tinny (T) started to live in the new house no 13.

If JM = MS and MS = ST then is JM = ST? By which axiom?

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| J |  |  |  | M |  |  |  | S |  |  |  | T |

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* 1. Given three collinear points J, M, S. name all the line segments.

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**TEST ITEM 3 DISCUSSION OF TWO FRIENDS**



* 1. Vincent and William were discussing about some geometrical concepts. William drew one figure and asked Vincent how many lines pass through both the points P and Q? He answered infinite lines. Do you agree?



* 1. Then it was Vincent’s turn. He also drew one figure and asked William, if AC = BD then what will be the relation between AB and CD? What should be William’s answer?



1. AB = CD (b) AB = ½ CD (c) AB = AC – CD (d) AB + BC = CD
   1. Then Rama asked Aditya. What is the minimum number of lines required to make a closed polygon?

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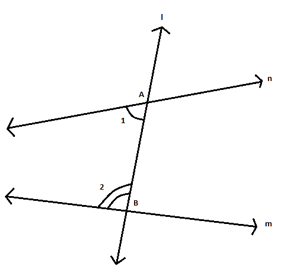
* 1. What do you call a closed figure formed by three line segments only?

**TEST ITEM 4 EUCLID’S FIFTH POSTULATE**



[Geometry](https://www.toppr.com/guides/maths/lines-and-angles/basics-of-geometry/) is in everything. The first attempts at understanding this art of nature were made even before recorded history. However, the most notable and influential was the Euclid Geometry. Euclid of Alexandria developed one of the most beautiful and the most interesting treatise of mathematics – Elements. Any [statement](https://www.toppr.com/guides/reasoning-ability/statements/statements-and-assumptions/) that is assumed to be true on the basis of reasoning or discussion is a [postulate](https://www.toppr.com/guides/maths/introduction-to-euclids-geometry/euclids-postulates/)His fifth postulate is very important. It is

“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**](https://byjus.com/maths/straight-lines/)**,** if produced indefinitely, meet on that side on which the sum of angles is less than two right angles.”



Circle the correct or incorrect for each of the following statements :

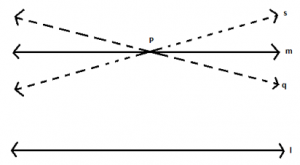
|  |  |
| --- | --- |
| Statement | Correct/ Incorrect |
| 4.1 In this figure, 4 interior angles are formed. | Correct/ Incorrect |
| 4.2 If the sum of interior angles 1 and 2 is less than two right angles, lines n and m will meet on the right side of line l. | Correct/ Incorrect |
| 4.3 If the sum of interior angles 1 and 2 is equal to two right angles, lines n and m will be parallel. | Correct/ Incorrect |

**TEST ITEM 5 JOHN PLAYFAIR’S VIEW**



The equivalent version of Euclid’s fifth postulate was given by John Playfair. As per him:

‘For every line l and for every point P not lying on l, there exists a unique line m passing through P and parallel to l’.



In the above figure, consider line l and a point P not lying on l.

* 1. How many lines can pass through the point P?

1. One (b) infinite (c) three (d) four
   1. How many lines passing through P and parallel to line l?
2. One (b) infinite (c) three (d) four
   1. In the figure which line is parallel to line l ?
3. Line s (b) line m (c) line q (d) none of these
   1. If B lies between A and C, AC = 12 cm and BC = 9 cm. What is AB2 ?

A B C

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* 1. If AB = x + 3, BC = 2x and AC = 4x-5, then what will be the value of x if B lies on AC?

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**TEST ITEM 6 PRIME MINISTER’S RELIEF FUND**

Rahman and Prakash contributed equal amount towardsPrime Minister Relief Fund.Prakash and Rahul contributed equal amount towards Prime MinisterRelief Fund if Rahul contributed Rs. 500.



6.1 How much Rahman contributed?

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6.2 Which Euclid axiom helps in reaching the correct answer?

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6.3 What is average amount of their contribution?

6. 4What valuesare depicted by them?

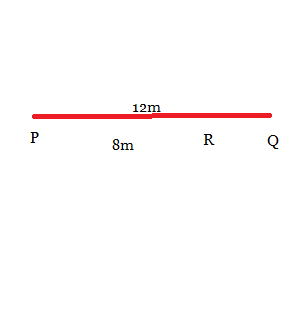
**TEST ITEM 7 APPLICATION OF AXIOM 5**

PQ is a line segment 12cm long and R is a point in its interior such that PR=8cm.

7.1 In which ratio point R divides line segment PQ.

(a) 1:2 (b) 2:3 (c) 3:2 (d) 2:1

7.2Find the value of PQ2 +PR 2 -2PQ. PR Ans:- -------------------



**TEST ITEM 8 APPLICATIONS OF EUCLIDSGEOMETRY**

 In Mathematics, a [statement](https://www.toppr.com/guides/reasoning-ability/statements/statements-and-assumptions/) is something that can either be true or false for everyone. For example: The sun rises in the East. In other words, if a statement has the same meaning everywhere and can either be true or false, it is a Mathematical statement.

A statement is a non-mathematical statement if it does not have a fixed meaning, or in other [words](https://www.toppr.com/guides/english/vocabulary/words/), is an ambiguous statement. For example, “It’s a lovely day.”. The statement is an opinion and will have a different meaning for different people, so its meaning is ambiguous.

8.1 Categorize the given statement as a Mathematical or a non Mathematical statement :

(i) The mass of the earth is greater than the moon .

Ans :\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(ii) Selena said her brother “Open all the doors and windows.”

Ans:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**CONJECTURE**

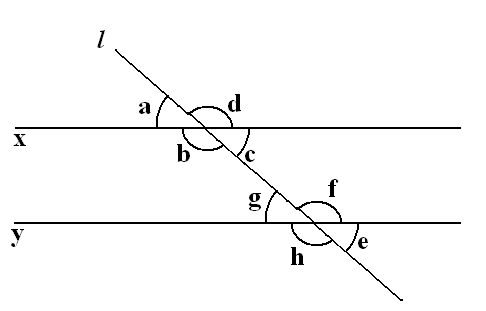
The formation or expression of an opinion or theory without sufficient evidence for proof is known as Conjecture . It is a statement that we arrive on with logical reasoning.

8.2 In the given series of number 13,26,39 ……….. , the fifth term is 65 . Can this statement be termed as conjecture ? Explain.

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**Axiom**

The word ‘Axiom’ is derived from the Greek word ‘Axioma’ meaning ‘true without needing a proof’. A mathematical statement which we assume to be true without a proof is called an axiom. Examples of axioms can be 2+2=4, 3 x 3=~~4~~9 etc. In geometry, we have a similar statement that a line can extend to infinity

8.3 In the given figure the lines x and y are parallel because the value of d=f . Can we term the above statement as axiom? Give reason .

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**TEST ITEM 9 BENEFITS OF CNG**

In a society the numbers of persons using CNG instead of petrol for their vehicles has increased by 15 and now the number is 25 .



9.1 Form a linear equation for the above .

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9.2Solve the above equation by Euclid’s Axiom.

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9.3 Which values are depicted by the society ?

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9.4 What is the full form of CNG ?

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**TEST ITEM 10 A STORY OF TWO FRIENDS**

Axioms or [Postulate](https://www.toppr.com/guides/maths/introduction-to-euclids-geometry/euclids-postulates/)s are defined as a statement that is accepted as true and correct Axioms present itself as self-evidence on which you can base any [arguments](https://www.toppr.com/guides/reasoning-ability/statements/statements-and-arguments/) or [inference](https://www.toppr.com/guides/english/reading-comprehension/inferences/). These are universally accepted and general truth. Euclid’s axioms are

(1) Things which are equal to the same thing are equal to one another.

(2) If equals are added to equals, the wholes are equal.

(3) If equals are subtracted from equals, the remainders are equal.

(4) Things which coincide with one another are equal to one another.

(5) The whole is greater than the part.

(6) Things which are double of the same things are equal to one another.

(7) Things which are halves of the same things are equal to one another.

* 1. Ben and Zen have the same weights say x kg. After some time they gain weight by 5 kg. What will be their present weights?

(a)5x (b) x + 5 (c) x – 5 (d) none of these.

10.2 Which Euclid’s axiom states that their present weights will be equal.

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10.3 These two friends then worked together and they have equal salary. But due to recession, their salaries are made half. The final salary of Ben and Zen will still be equal. (true/ false)?

10.4 Which Axiom of Euclid tells us this rule?

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