MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

INTRODUCTION TO EUCLID'S GEOMETRY

Solved Examples

1. If A,B and C are three points on a line and B lies between A and C (as shown in the given figure), then prove that AB+ BC= AC

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

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3. Solve the equation x-5 =15

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4. Prove that an equilateral triangle can be constracted on any given line segment

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5. In the given figure C is the midpoint of AB,D is the midpoint of XY and AC=XD Using an

Euclid 's axiom prove that AB =XY

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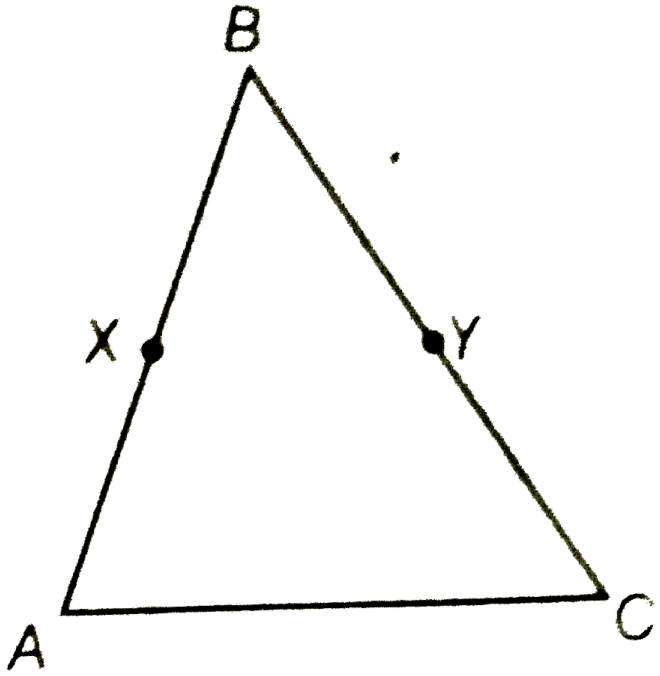
6. In the given figure a $\triangle ABC$ is given in which AB=BC and BX =BY show that AX =CY



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7. In the given figure we have $\angle 1 = \angle 3$ and $\angle 2 = \angle 4$ show that $\angle A = \angle C$

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8. In the given figure we have $\angle 1 = \angle 3, \angle 2 = \angle 4$ and $\angle 3 = \angle 4$ prove that $\angle 1 = \angle 2$

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9. Write which of the following statement are true and which are false

(i) A simple closed figure made up of three or more line segments is called a polygon

(ii) Part of a line with two end points is called a line segment

(iii) In geometry we take a point a line and plane as undefined terms

(iv) Euclid fourth axiom says that everything equals itself

(v) The Euclidean geometry is valid only for

figure in the plane

(vi) A figure formed by two rays with a common initial point is called an angle

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Example

1. In the given figure if AC=BD then prove that AB=CD

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Exercise

1. What is the difference between a theorem and an axiom?

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2. Define the following terms:

(i) Line segment (ii) Ray (iii) intersecting lines

(iv) Parallel lines (v) Half line (vi) Concurrent lines (vii) Collinear points (viii) Plane

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3. In the adjoining figure name

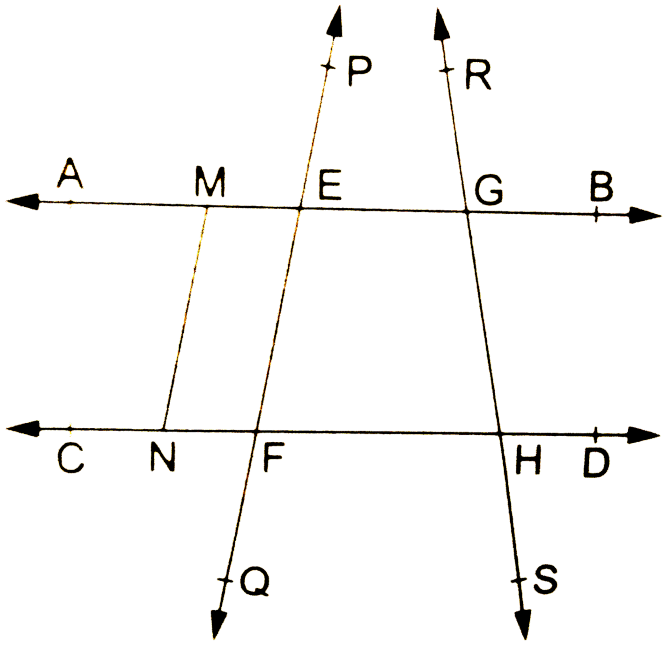
(i) six points

(ii) five line segments

(iii) four rays

(iv) four lines

four collinear points



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4. In the adjoining figure name

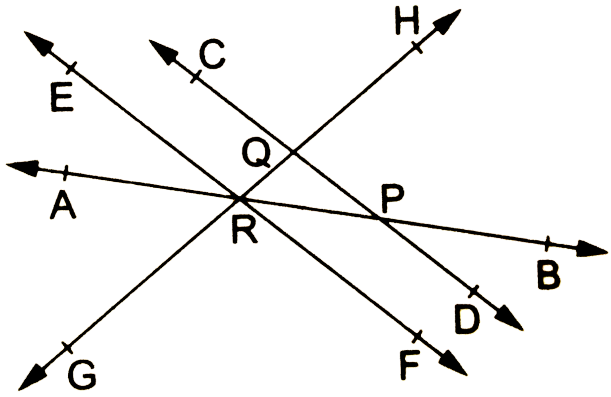
(i) Two pairs of intersecting lines and their

corresponding points of intersection

(ii) Threee concurrent lines and their points of intersection

(iii) Three rays

(iv) Two line segments



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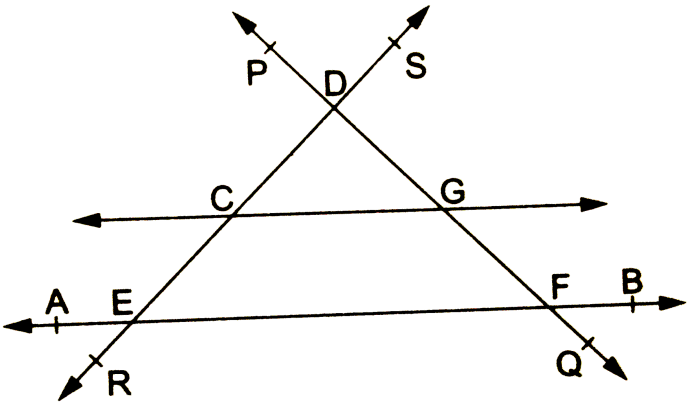
5. From the given figure name the following

(i) Three lines

(ii) One rectilinear figure

(iii) Four concurrent points



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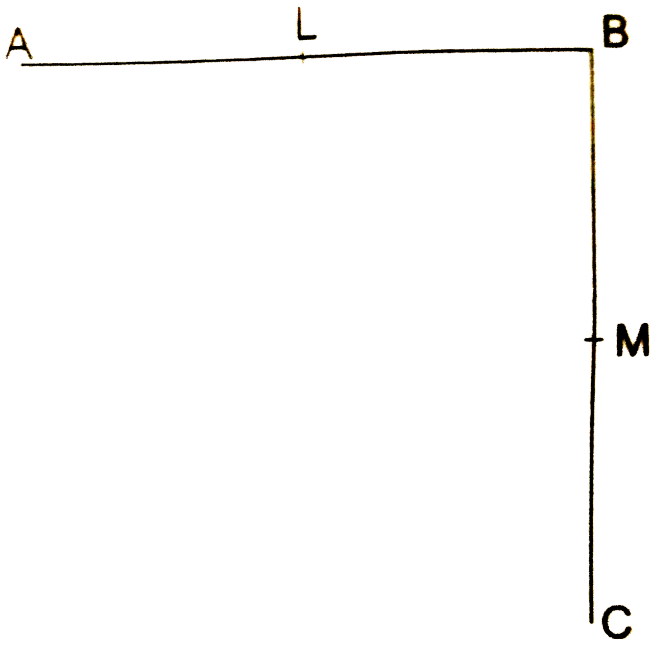
6. In the given figure L and M are the midpoints of AB and BC respectivcely

(i) If AB= BC prove that AL = MC

(ii) If BL = BM prove that AB=BC



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Exercise 6

1. (i) How many lines can be drawn to pass through a given points ?

(ii) How many lines can be drawn to pass through two given points?

(iii) In how many points can the two lines at the most intersect?

(iv) If A, B, C are three collinear points name all the line segments determined by them

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2. Which of the following statements are true ?

(i) A line segment has no definite length

(ii) A ray has no end point

(iii) A line has definite length

(iv) A line AB is the same as line BA

(v) A ray AB is the same as ray BA

(vi) Two distnict points always determine a unique line

(vii) Three lines are concurrent if they have a common point

(viii)T wo distinct lines cannot have more than

one point in common

(ix) Two intersecting lines cannot be both parallel to the same line

(x) open half line is the same thing as ray

(xi) Two lines may intersect in two points

(xii) Two lines are parallel only when they have no point in common

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Multiple Choice Questions (Mcq)

1. In ancient India, the shapes of altars used for household rituals were

A. square and rectangles

B. squares and circles

C. triangle and rectangles

D. trapezium and pyramid

Answer: B

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2. In ancient India, altars with combination of shapes like rectangles, triangles and trapeziums were used for

A. household rituals

B. public rituals

C. both (a) and (b)

D. none of (a) , (b) and (c)

Answer: B

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3. The number of interwoven isosceles triangles in Sriyantra (in the Atharvaveda) is

A. five

B. sevan

C. nine

D. eleven

Answer: C

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4. In the Indus valley civilization (about BC 3000) the bricks used for construction work were having dimensions in the ratio of

A. $5:3:2$

B. $4:2:1$

C. $4:3:2$

D. $6:4:2$

Answer: B

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5. In to how many chapters was the famous treatise The elements divided by Euclid belongs to the country

A. 13

B. 12

C. 11

D. 9

Answer: A

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6. Euclid belongs to the country

A. india

B. greece

C. japan

D. egypt

Answer: B

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7. Thales belongs to the country

A. india

B. egypt

C. greece

D. babylonia

Answer: C

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8. Pythagoras was a student of

A. Euclid

B. Thales

C. Archimedes

D. Bhaskara

Answer: B

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9. Which of the following needs a proof?

A. axiom

B. postulate

C. definition

D. theorem

Answer: D

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10. The statement that the **lines are parallel if they do not intersect** is in the form of

A. a definition

B. an axiom

C. a postulate

D. a theorem

Answer: A

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11. Euclid stated that all right angles are equal to each other in the form of

A. a definition

B. an axiom

C. a postulate

D. a proof

Answer: C

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12. A pyramid is a solid figure whose base is

A. only a triangle

B. only a square

C. only a rectangle

D. any polygon

Answer: D

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13. The side faces of a pyramid are

A. triangles

B. squares

C. trapeziums

D. polygons

Answer: A

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14. The number of dimensions of a solid are

A. 1

B. 2

C. 3

D. 5

Answer: C

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15. the number of dimension,a surface has

A. 1

B. 2

C. 3

D. 0

Answer: B

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16. How many dimensions does a point have

A. 0

B. 1

C. 2

D. 3

Answer: A

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17. Boundaries of solids are

A. lines

B. curves

C. surfaces

D. none of these

Answer: C

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18. Boundaries of surfaces are curves.

A. lines

B. curves

C. polygons

D. none of these

Answer: B

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19. The number of planes passing through 3 non-collinear points is

A. 4

B. 3

C. 2

D. 1

Answer: D

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20. Axioms are assumed

A. definitions

B. theorems

C. universal truth specific to geometry

D. universal truths in all branches of mathematics

Answer: D

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21. Which of the following is a true statement ?

A. The floor and a wall of a room are parallel planes

B. The ceiling and a wall of a room are parallel planes

C. The floor and the ceiling of a room are parallel planes

D. Two adjacent walls of a room are parallel planes

Answer: C

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22. Which of the following is a true statement ?

A. Only a unique line can be drawn to pass through a given point

B. infinitely many lines can be drawn to pass through two given points

C. If two circles are equal then their radii are equal

D. a line has a definite length

Answer: C

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23. Which of the following is a false statement

A. an infinite number of lines can be drawn to pass through a given point

B. a unique line can be drawn to pass through two given points

C. $Ray\overline{AB} = Ray\overline{BA}$

D. A ray has one end point

Answer: C

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24. A point C is called the midpoint of a line segment $\overline{AB}$ if

A. C is an intrerior points of AB

B. AC =CB

C. C is an interior point of AB such that $\overline{AC} = \overline{CB}$

D. AC+CB=AB

Answer: C

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25. A point C is said to lie between the points A and B if

A. AC=AB

B. AC+CB=AB

C. points A,C and B are collinear

D. none of these

Answer: C

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26. Euclid s which axiom illustrates the statement that when x+y =15

A. first

B. second

C. third

D. fourth

Answer: B

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27. A is of the same age as B and C is of the same age as B Euclid 's which axiom illustrates the relative ages of A and C?

A. first axiom

B. second axiom

C. third axiom

D. fourth axiom

Answer: A

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