MATHEMATICS

Important Questions

Multiple Choice questions-

Question 1. Which of the following statements are true?

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

b) There is an infinite number of lines which pass through two distinct points.

c) A terminated line can be produced indefinitely on both the sides

d) If two circles are equal, then their radii are unequal.

Question 2. A solid has _____dimensions.

a) One

b) Two

c) Three

d) Zero

Question 3. A point has _____ dimension.

a) One

b) Two

c) Three

d) Zero

Question 4. The shape of base of Pyramid is:

a) Triangle

b) Square

c) Rectangle

d) Any polygon

Question 5. The boundaries of solid are called:

a) Surfaces

b) Curves

c) Lines

d) Points

Question 6. A surface of a shape has:

a) Length, breadth and thickness

b) Length and breadth only

c) Length and thickness only

d) Breadth and thickness only

Question 7. The edges of the surface are :

a) Points

b) Curves

c) Lines

d) None of the above

Question 8. Which of these statements do not satisfy Euclid's axiom?

a) Things which are equal to the same thing are equal to one another

b) If equals are added to equals, the wholes are equal.

c) If equals are subtracted from equals, the remainders are equal.

d) The whole is lesser than the part.

Question 9. The line drawn from the center of the circle to any point on its circumference is called:

a) Radius

b) Diameter

c) Sector

d) Arc

Question 10. There are _____ number of Euclid's Postulates

a) Three

b) Four

c) Five

d) Six

Very Short:

1. Give a definition of parallel lines. Are there other terms that need to be defined first? What are they and how might you define them?

2. Give a definition of perpendicular lines. Are there other terms that need to be defined first ? What are they and how might you define them?

3. 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?

4. Solve the equation a - 15 = 25 and state which axiom do you use here.

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

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

7. If a point P be the mid-point of MN and C is the mid-point of MP, then write the relation between MC and MN

8. How many lines does pass through two distinct points?

9. In the given figure, if AB = CD, then prove that AC = BD. Also, write the Euclid's axiom used for proving it.

Short Questions:

1. Define:

   (a) a square (b) perpendicular line

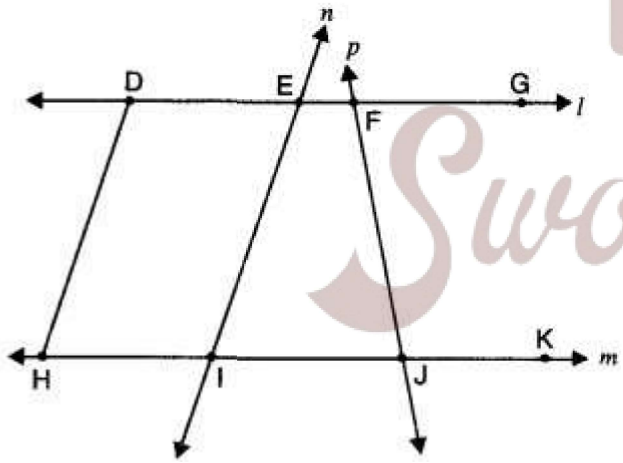
2. In the given figure, name the following:

   (i) Four collinear points

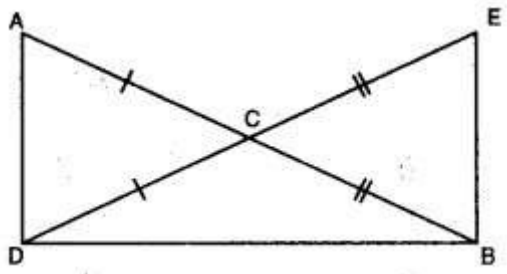
   (ii) Five rays

   (iii) Five-line segments

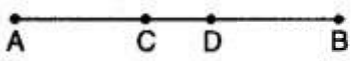
   (iv) Two-pairs of non-intersecting line segments.



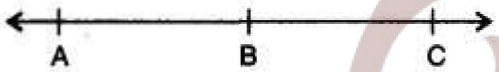
3. In the given figure, AC = DC and CB = CE. Show that AB = DE. Write the Euclid's axiom to support this



4. In figure, it is given that AD=BC. By which Euclid's axiom it can be proved that AC = BD?

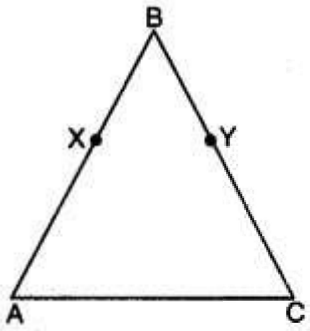


5. If A, B and C are any three points on a line and B lies between A and C (see figure), then prove that AB + BC = AC



6. In the given figure, AB = BC, BX = BY, show that

AX = CY.



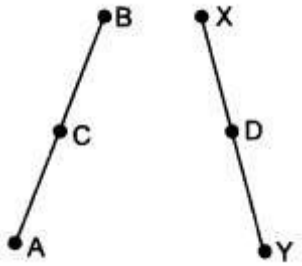
Long Questions:

1. For given four distinct points in a plane, find the number of lines that can be drawn through:

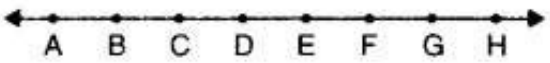
   (i) When all four points are collinear.

   (ii) When three of the four points are collinear.

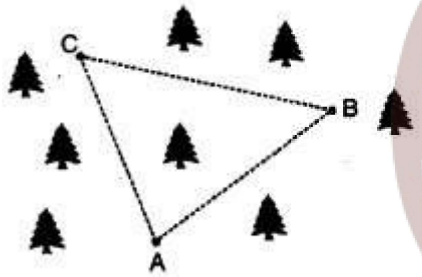
   (iii) When no three of the four points are collinear.



2. Show that: length AH > sum of lengths of AB + BC + CD.



3. Rohan's maid has two children of same age. Both of them have equal number of dresses. Rohan on his birthday plans to give both of them same number of dresses. What can you say about the number of dresses each one of them will have after Rohan's birthday? Which Euclid's axiom is used to answer this question? What value is Rohan depicting by doing so? Write one more Euclid's axiom.
4. Three lighthouse towers are located at points A, B and C on the section of a national forest to protect animals from hunters by the forest department as shown in figure. Which value is department exhibiting by locating extra towers? How many straight lines can be drawn from A to C? State the Euclid Axiom which states the required result. Give one more. Postulate.



Assertion and Reason Questions-

1. In these questions, a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

a) Assertion and reason both are correct statements and reason is correct explanation for assertion.

b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

c) Assertion is correct statement but reason is wrong statement.

d) Assertion is wrong statement but reason is correct statement.

Assertion: There can be infinite number of lines that can be drawn through a single point.

Reason: From this point we can draw only two lines.

2. In these questions, a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

a) Assertion and reason both are correct statements and reason is correct explanation for assertion.

b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

c) Assertion is correct statement but reason is wrong statement.

d) Assertion is wrong statement but reason is correct statement.

Assertion: Through two distinct points there can be only one line that can be drawn.

Reason: From this two point we can draw only one line.

Answer Key:

MCQ:

1. (c) A terminated line can be produced indefinitely on both the sides
2. (c) Three
3. (d) Zero
4. (d) Any polygon
5. (a) Surfaces
6. (b) Length and breadth only
7. (c) Lines
8. (d) The whole is lesser than the part.
9. (a) Radius
10. (c) Five

Very Short Answer:

1. Two coplanar lines in a plane) which are not intersecting are called parallel lines. The other term intersecting is undefined.
2. Two coplanar (in a plane) lines are perpendicular if the angle between them at the point of intersection is one right angle. The other terms point of intersection and one right angle are undefined.
3. A line segment PQ of a line 'l is the continuous part of the line I with end points P and Q.

Here, continuous part of the line 'l is undefined.

4. a - 15 = 25

On adding 15 to both sides, we obtain

a - 15 + 15 = 25 + 15 [using Euclid's second axiom]

a = 40

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

On adding 2kg,

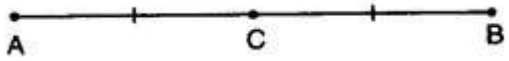
Weight of Ram and Ravi will be (x + 2) kg each.

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

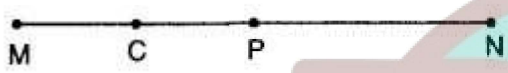
6. Here, C is the mid-point of AB

⇒ AC = BC

⇒ $AC = BC = \frac{1}{2}AB$



7. Here, P is the mid-point of MN and C is the mid-point of MP.



$\therefore MC = \frac{1}{4}MN$

8. One and only one.

9. Here, given that

AB = CD

By using Euclid's axiom 2, if equals are added to equals, then the wholes are equal, we have

AB + BC = CD + BC

⇒ AC = BD

Short Answer:

Ans: 1. (a) A square: A square is a rectangle having same length and breadth. Here, undefined term are length, breadth, and rectangle.

(b) Perpendicular lines: Two coplanar (in a plane) lines are perpendicular, if the angle between the at the point of intersection is one right angle. Here, the term one right angle is undefined.

Ans: 2. (i) Four collinear points are D, E, F, G and H, I, J, K

(ii) Five rays are DG, EG, FG, HK, IK.

(iii) Five-line segments are DH, EI, FJ, DG, HK.

(iv) Two-pairs of non-intersecting line segments are (DH, EI) and (DG, HK).

Ans: 3. We have

AC = DC

CB = CE

By using Euclid's axiom 2, if equals are added to equals, then wholes are equal.

⇒ AC + CB = DC + CE

⇒ AB = DE.

Ans: 4. We can prove it by Euclid's axiom 3. "If equals are subtracted from equals, the remainders are equal."

We have AD = BC

⇒ AD – CD = BC – CD

⇒ AC = BD

Ans: 5. In the given figure, AC coincides with AB + BC. Also, Euclid's axiom 4, states that things which coincide with one another are equal to one another. So, it is evident that:

AB + BC = AC.

Ans: 6. Given that AB = BC

and BX = BY

By using Euclid's axiom 3, equals subtracted from equals, then the remainders are equal, we have

AB – BX = BC – BY

AX = CY

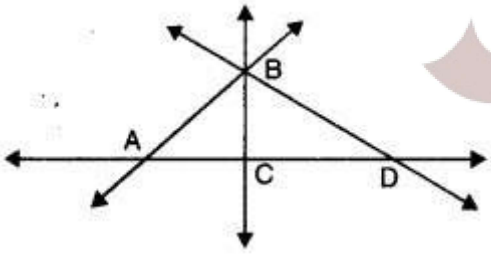
Long Answer:

Ans: 1. 

(i) Consider the points given are A, B, C and D.

When all the four points are collinear:

One line $\overrightarrow{AD}$.



(ii) When three of the four points are collinear:

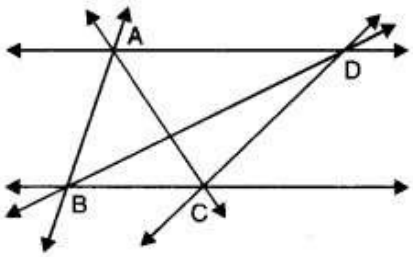
4 lines

Here, we have four lines $\overleftrightarrow{AB}, \overleftrightarrow{BC}, \overleftrightarrow{BD}, \overleftrightarrow{AD}$ (four).

(iii) When no three of the four points are collinear:

6 lines Here, we have

$\overleftrightarrow{AB}, \overleftrightarrow{BC}, \overleftrightarrow{AC}, \overleftrightarrow{AD}, \overleftrightarrow{BD}, \overleftrightarrow{CD}$ (six)



Ans: 2. We have

AH = AB + BC + CD + DE + EF + FG + GH

Clearly, AB + BC + CD is a part of AH.

⇒ AH > AB + BC + CD

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

Ans: 3. Here, Rohan's maid has two children of same age group and both of them have equal number of dresses. Rohan on his birthday plans to give both of them same number of dresses.

∴ By using Euclid's Axiom 2, if equals are added to equals, then the whole are equal. Thus, again both of them have equal number of dresses. Value depicted by Rohan are caring and other social values. According to Euclid's Axiom 3, if equals are subtracted from equals, then the remainders

are equal.

Ans: 4. One and only one line can be drawn from A to C. According to Euclid's Postulate, "A straight line may be drawn from any point to any other point:" Another postulate: "A circle may be described with any Centre and any radius." Wildlife is a part of our environment and conservation of each of its element is important for ecological balance.

Assertion and Reason Answers-

1. c) Assertion is correct statement but reason is wrong statement.

2. a) Assertion and reason both are correct statements and reason is correct explanation for assertion.