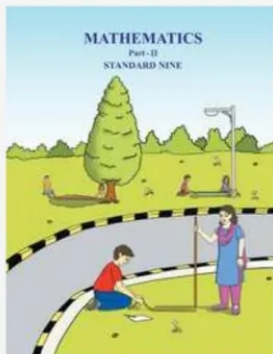


Maharashtra Board Solutions Class 9-Maths

(Part 2): Chapter 1.1- Basic Concepts in Geometry

BOOK SOLUTIONS
CLASS 9
MATHS (PART 2)

CHAPTER 1.1
Basic Concepts in Geometry



Maharashtra Board Solutions→

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Maharashtra Board Solutions Class 9-Maths

(Part 2): Chapter 1.1- Basic Concepts in Geometry

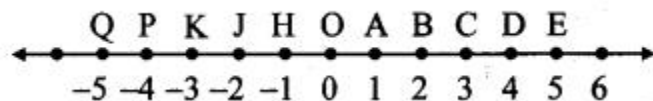
Class 9: Maths Chapter 1.1 solutions. Complete Class 9 Maths Chapter 1.1 Notes.

Maharashtra Board Solutions Class 9-Maths (Part 2): Chapter 1.1- Basic Concepts in Geometry

Maharashtra Board 9th Maths Chapter 1.1, Class 9 Maths Chapter 1.1 solutions

Question 1.

Find the distances with the help of the number line given below.



- i. $d(B, E)$
- ii. $d(J, J)$
- iii. $d(P, C)$
- iv. $d(J, H)$
- v. $d(K, O)$
- vi. $d(O, E)$
- vii. $d(P, J)$
- viii. $d(Q, B)$

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Solution:

i. Co-ordinate of the point B is 2.

Co-ordinate of the point E is 5.

Since, $5 > 2$

$$\therefore d(B, E) = 5 - 2$$

$$\therefore d(B, E) = 3$$

ii. Co-ordinate of the point J is -2.

Co-ordinate of the point A is 1.

Since, $1 > -2$

$$\therefore d(J, A) = 1 - (-2)$$

$$= 1 + 2$$

$$\therefore d(J, A) = 3$$

iii. Co-ordinate of the point P is -4.

Co-ordinate of the point C is 3.

Since, $3 > -4$

$$\therefore d(P, C) = 3 - (-4)$$

$$= 3 + 4$$

$$\therefore d(P, C) = 7$$

iv. Co-ordinate of the point J is -2.

Co-ordinate of the point H is -1.

Since, $-1 > -2$

$$\therefore d(J, H) = -1 - (-2)$$

$$= -1 + 2$$

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$$\therefore d(J, H) = 1$$

v. Co-ordinate of the point K is -3.

Co-ordinate of the point O is 0.

Since, $0 > -3$

$$\therefore d(K, O) = 0 - (-3)$$

$$= 0 + 3$$

$$\therefore d(K, O) = 3$$

vi. Co-ordinate of the point O is 0.

$\therefore$ Co-ordinate of the point E is 5.

Since, $5 > 0$

$$\therefore d(O, E) = 5 - 0$$

$$\therefore d(O, E) = 5$$

vii. Co-ordinate of the point P is -4.

Co-ordinate of the point J is -2.

Since $-2 > -4$

$$\therefore d(P, J) = -2 - (-4)$$

$$= -2 + 4$$

$$\therefore d(P, J) = 2$$

viii. Co-ordinate of the point Q is -5.

Co-ordinate of the point B is 2.

Since, $2 > -5$

$$\therefore d(Q, B) = 2 - (-5)$$

$$= 2 + 5$$

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$$\therefore d(Q, B) = 7$$

Question 2.

If the co-ordinate of A is x and that of B is . y, find d(A, B).

i. $x = 1, y = 7$

ii. $x = 6, y = -2$

iii. $x = -3, y = 7$

iv. $x = -4, y = -5$

v. $x = -3, y = -6$

vi. $x = 4, y = -8$

Solution:

i. Co-ordinate of point A is $x = 1$.

Co-ordinate of point B is $y = 7$

Since, $7 > 1$

$$\therefore d(A, B) = 7 - 1$$

$$\therefore d(A, B) = 6$$

ii. Co-ordinate of point A is $x = 6$.

Co-ordinate of point B is $y = -2$.

Since, $6 > -2$

$$\therefore d(A, B) = 6 - (-2) = 6 + 2$$

$$\therefore d(A, B) = 8$$

iii. Co-ordinate of point A is $x = -3$.

Co-ordinate of point B is $y = 7$.

Since, $7 > -3$

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$$\therefore d(A, B) = 7 - (-3) = 7 + 3$$

$$\therefore d(A, B) = 10$$

iv. Co-ordinate of point A is $x = -4$.

Co-ordinate of point B is $y = -5$.

Since, $-4 > -5$

$$\therefore d(A, B) = -4 - (-5)$$

$$= -4 + 5$$

$$\therefore d(A, B) = 1$$

v. Co-ordinate of point A is $x = -3$.

Co-ordinate of point B is $y = -6$.

Since, $-3 > -6$

$$\therefore d(A, B) = -3 - (-6)$$

$$= -3 + 6$$

$$\therefore d(A, B) = 3$$

vi. Co-ordinate of point A is $x = 4$.

Co-ordinate of point B is $y = -8$.

Since, $4 > -8$

$$\therefore d(A, B) = 4 - (-8)$$

$$= 4 + 8$$

$$\therefore d(A, B) = 12$$

Question 3.

From the information given below, find which of the point is between the other two. If the points are not collinear, state so.

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i. $d(P, R) = 7, d(P, Q) = 10, d(Q, R) = 3$

ii. $d(R, S) = 8, d(S, T) = 6, d(R, T) = 4$

iii. $d(A, B) = 16, d(C, A) = 9, d(B, C) = 7$

iv. $d(L, M) = 11, d(M, N) = 12, d(N, L) = 8$

v. $d(X, Y) = 15, d(Y, Z) = 7, d(X, Z) = 8$

vi. $d(D, E) = 5, d(E, F) = 8, d(D, F) = 6$

Solution:

i. Given, $d(P, R) = 7, d(P, Q) = 10, d(Q, R) = 3$

$$d(P, Q) = 10 \dots (i)$$

$$d(P, R) + d(Q, R) = 7 + 3 = 10 \dots (ii)$$

$$\therefore d(P, Q) = d(P, R) + d(Q, R) \dots [\text{From (i) and (ii)}]$$

$\therefore$ Point R is between the points P and Q

i. e., $P - R - Q$ or $Q - R - P$.

$\therefore$ Points P, R, Q are collinear.

ii. Given, $d(R, S) = 8, d(S, T) = 6, d(R, T) = 4$

$$d(R, S) = 8 \dots (i)$$

$$d(S, T) + d(R, T) = 6 + 4 = 10 \dots (h)$$

$$\therefore d(R, S) \neq d(S, T) + d(R, T) \dots [\text{From (i) and (ii)}]$$

$\therefore$ The given points are not collinear.

iii. Given, $d(A, B) = 16, d(C, A) = 9, d(B, C) = 7$

$$d(A, B) = 16 \dots (i)$$

$$d(C, A) + d(B, C) = 9 + 7 = 16 \dots (ii)$$

$$\therefore d(A, B) = d(C, A) + d(B, C) \dots [\text{From (i) and (ii)}]$$

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∴ Point C is between the points A and B.

i. e., $A - C - B$ or $B - C - A$.

∴ Points A, C, B are collinear

iv. Given, $d(L, M) = 11$, $d(M, N) = 12$, $d(N, L) = 8$

$d(M, N) = 12$...(i)

$d(L, M) + d(N, L) = 11 + 8 = 19$...(ii)

∴ $d(M, N) \neq d(L, M) + d(N, L)$... [From (i) and (ii)]

∴ The given points are not collinear.

v. Given, $d(X, Y) = 15$, $d(Y, Z) = 7$, $d(X, Z) = 8$

$d(X, Y) = 15$...(i)

$d(X, Z) + d(Y, Z) = 8 + 7 = 15$...(ii)

∴ $d(X, Y) = d(X, Z) + d(Y, Z)$... [From (i) and (ii)]

∴ Point Z is between the points X and Y

i. e., $X - Z - Y$ or $Y - Z - X$.

∴ Points X, Z, Y are collinear.

vi. Given, $d(D, E) = 5$, $d(E, F) = 8$, $d(D, F) = 6$

$d(E, F) = 8$...(i)

$d(D, E) + d(D, F) = 5 + 6 = 11$...(ii)

∴ $d(E, F) \neq d(D, E) + d(D, F)$... [From (i) and (ii)]

∴ The given points are not collinear.

Question 4.

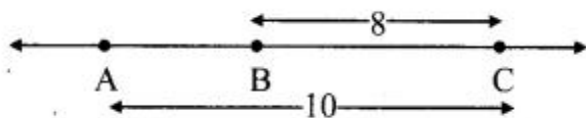
On a number line, points A, B and C are such that $d(A, C) = 10$, $d(C, B) = 8$. Find $d(A, B)$ considering all possibilities.

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Solution:

Given, $d(A, C) = 10$, $d(C, B) = 8$.

Case I: Points A, B, C are such that, $A - B - C$.



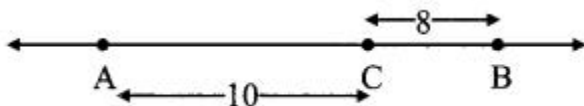
$$\therefore d(A, C) = d(A, B) + d(B, C)$$

$$\therefore 10 = d(A, B) + 8$$

$$\therefore d(A, B) = 10 - 8$$

$$\therefore d(A, B) = 2$$

Case II: Points A, B, C are such that, $A - C - B$.

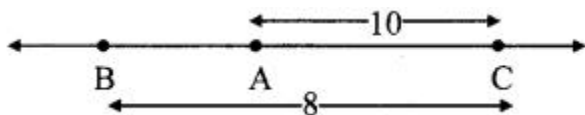


$$\therefore d(A, B) = d(A, C) + d(C, B)$$

$$= 10 + 8$$

$$\therefore d(A, B) = 18$$

Case III: Points A, B, C are such that, $B - A - C$.



From the diagram,

$$d(A, C) > d(B, C)$$

Which is not possible

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$\therefore$ Point A is not between B and C.

$\therefore d(A, B) = 2$ or $d(A, B) = 18$.

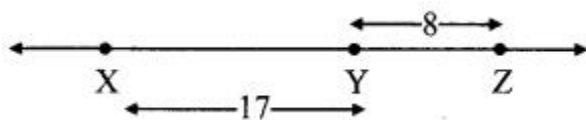
Question 5.

Points X, Y, Z are collinear such that $d(X, Y) = 17$, $d(Y, Z) = 8$, find $d(X, Z)$.

Solution:

Given, $d(X, Y) = 17$, $d(Y, Z) = 8$

Case I: Points X, Y, Z are such that, $X - Y - Z$.

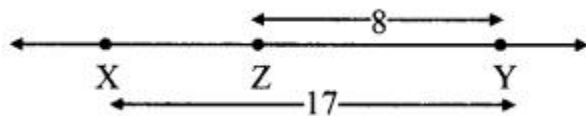


$$\therefore d(X, Z) = d(X, Y) + d(Y, Z)$$

$$= 17 + 8$$

$$\therefore d(X, Z) = 25$$

Case II: Points X, Y, Z are such that, $X - Z - Y$.



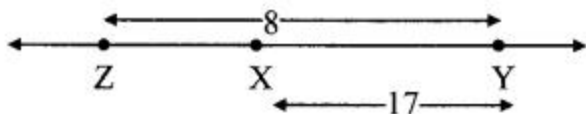
$$\therefore d(X, Y) = d(X, Z) + d(Z, Y)$$

$$\therefore 17 = d(X, Z) + 8$$

$$\therefore d(X, Z) = 17 - 8$$

$$\therefore d(X, Z) = 9$$

Case III: Points X, Y, Z are such that, $Z - X - Y$.



From the diagram,

$$d(X, Y) > d(Y, Z)$$

Which is not possible

$\therefore$ Point X is not between Z and Y.

$$\therefore d(X, Z) = 25 \text{ or } d(X, Z) = 9.$$

Question 6.

Sketch proper figure and write the answers of the following questions. [2 Marks each]

i. If $A - B - C$ and $l(AC) = 11$,

$$l(BC) = 6.5, \text{ then } l(AB) = ?$$

ii. If $R - S - T$ and $l(ST) = 3.7$,

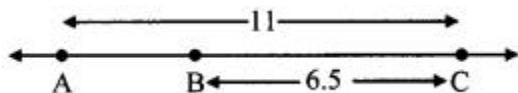
$$l(RS) = 2.5, \text{ then } l(RT) = ?$$

iii. If $X - Y - Z$ and $l(XZ) = 3\sqrt{7}$,

$$l(XY) = \sqrt{7}, \text{ then } l(YZ) = ?$$

Solution:

i. Given, $l(AC) = 11$, $l(BC) = 6.5$



$$l(AC) = l(AB) + l(BC) \dots [A - B - C]$$

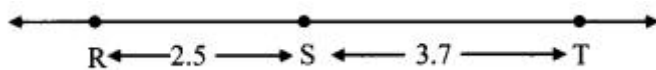
$$\therefore 11 = l(AB) + 6.5$$

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$$\therefore l(AB) = 11 - 6.5$$

$$\therefore l(AB) = 4.5$$

ii. Given, $l(ST) = 3.7$, $l(RS) = 2.5$

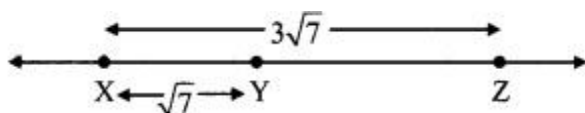


$$l(RT) = l(RS) + l(ST) \dots [R - S - T]$$

$$= 2.5 + 3.7$$

$$\therefore (RT) = 6.2$$

iii. $l(XZ) = 3\sqrt{7}$, $l(XY) = \sqrt{7}$,



$$l(XZ) = l(XY) + l(YZ) \dots [X - Y - Z]$$

$$\therefore 3\sqrt{7} \Rightarrow \sqrt{7} + l(YZ)$$

$$\therefore l(YZ) = 3\sqrt{7} - \sqrt{7}$$

$$\therefore l(YZ) = 2\sqrt{7}$$

Question 7.

Which figure is formed by three non-collinear points?

Solution:

Three non-collinear points form a triangle.



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Class 9 Maths

Part 2

- Chapter 1.1- Basic Concepts in Geometry
- Chapter 1.2- Basic Concepts in Geometry
- Chapter 1.3- Basic Concepts in Geometry
- Chapter 2.1- Parallel Lines
- Chapter 2.2- Parallel Lines
- Chapter 3.1- Triangles
- Chapter 3.2- Triangles
- Chapter 3.3- Triangles
- Chapter 3.4- Triangles
- Chapter 3.5- Triangles
- Chapter 4.1- Constructions of Triangles
- Chapter 4.2- Constructions of Triangles
- Chapter 4.3- Constructions of Triangles
- Chapter 5.1- Quadrilaterals
- Chapter 5.2- Quadrilaterals
- Chapter 5.3- Quadrilaterals
- Chapter 5.4- Quadrilaterals
- Chapter 5.5- Quadrilaterals
- Chapter 6.1- Circle
- Chapter 6.2- Circle
- Chapter 6.3- Circle
- Chapter 7.1- Co-ordinate Geometry
- Chapter 7.2- Co-ordinate Geometry
- Chapter 8.1- Trigonometry
- Chapter 8.2- Trigonometry
- Chapter 9.1- Surface Area and Volume
- Chapter 9.2- Surface Area and Volume
- Chapter 9.3- Surface Area and Volume

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The Maharashtra government established the Maharashtra State Bureau of Textbook Production and Curriculum Research, also commonly referred to as Ebalbharati, in 1967 to take up the responsibility of providing quality textbooks to students from all classes studying under the Maharashtra State Board. MSBHSE prepares and updates the curriculum to provide holistic development for students. It is designed to tackle the difficulty in understanding the concepts with simple language with simple illustrations. Every year around 10 lakh students are enrolled in schools that are affiliated with the Maharashtra State Board.

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