MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

COORDINATE GEOMETRY

Thinking Corner

1. A man goes 3 km towards north and then 4 km towards east. How far is he away from the initial poisition ?

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2. If D is the midpoint of AC and C is the midpoint of Ab, then find the length of AB if AD=4cm.

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3. $A(6, 1), B(8, 2)$ and $C(9, 4)$ are three vertices of a parallelograam ABCd taken in order. Find the fourth vertex D. IF $(x_1, y_1), (x_2, y_2), (x_3, y_3)$ and (x_4, y_4) are the four vertices of the parallelgraam then using the given points, find the value of $(x_1 + x_3 - x_2, y_1 + y_3 + y_2)$ and state the reason for your result.

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4. (i) What happens when m=n=1? Can you identify it with a result already proved?

(ii) $AP:PB=1:2$ and $AQ:QC=2:1$ What is AP:AB? What is AQ:AC?

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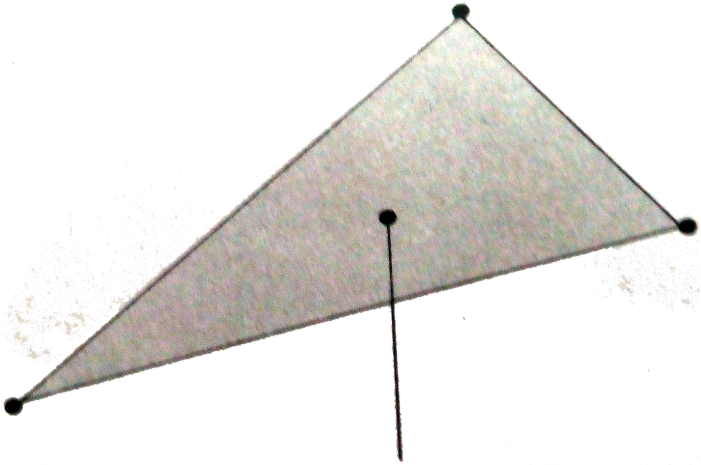
5. Master gave a traiangular plate with vertices $A(5,8), B(2,4)C(8,3)$ and a stick to a student. He wants to balance the plate on the stick. Can you help the boy to locate theat point which can balance the

plate.



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Exercise 5 1

1. Plot the following points in the coordinate system and identify the quadrants

$P(-7,6), Q(7,-2), R(-6,-7) S(3,5)$ and $T(3,9)$

.

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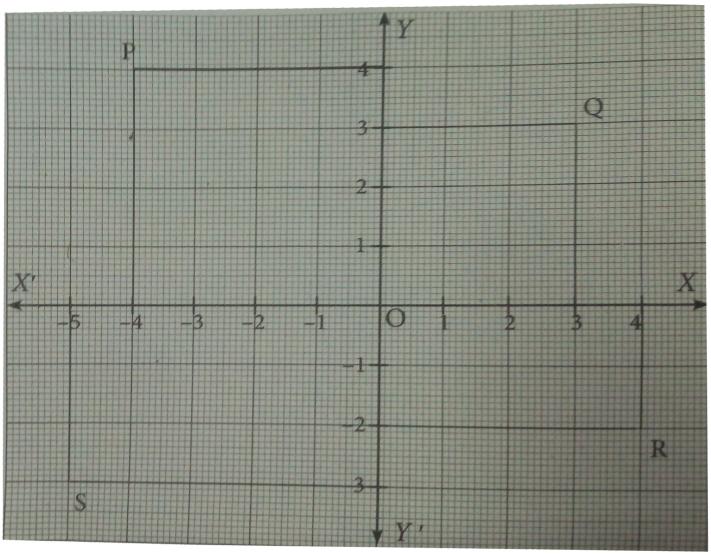
2. Write down the abscissa and ordinate of the following.

(i) P (ii) Q (iii) R (iv) S



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3. Plot the following points in the coordinate plane and join them. What is the your conclusion about the resulting figure ?

(i) (-5,3)(-1,3)(0,3) (5,3) (ii) (0,-4) (0,-2)(0,4) (0,5)

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4. Plot the following points in the coordinate plane . Join them in order. What type of geometrical shape is formed ?

(i) `(0,0) (-4,0) (-4,-4) (0,-4)

(ii) (-3,3) (2,3) (-6,-1) (5,-1).

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Exercise 5 2

1. Find the distance between the following pairs of points. (i) (1,2) and (4,3)

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2. Determine whether the given set of points in each case are colliner or not .

(7,-2),(5,1),(3,4).

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3. Show that the folloiwng points taken in order form an isosceles triangle .

(i) A(5,4), B (2,0),C(-2,3) (ii) A(6,4),B(-2,-4),C(2,10)

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4. Show that the following points taken in order form an equilateral triangle in each case .

(i) $A(2, 2), B(-2, -2), C-2\sqrt{3}, 2\sqrt{3})$ (ii) $A(\sqrt{3}, 2), B(0, 1), C(0, 3)$

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5. Show that the following points taken in orhder to form vertices of a parallelogram.

$A(-3, 1), B(-6, -7), C(3, -9)$ and $D(6, -1)$

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6. Verifgy that the following points taken in order form the vertices of a rhombus.

A(3,-2),B(7,6),C(-1,2) and D(-5,-6)

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7. $A(-1,1), B(1,3)$ and $C(3,a)$ are points and if AB=BC, then find 'a'

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8. The abscissa of point A is equal to its ordinate, and its distance from the point B(1,3) is 10 units, What are the coordinates of A?

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9. The points (x,y) is equidistant from the points (3,4) and (-5,6) . Find a relation between x and y.

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10. Let A(2,3) and B(2,-4) be two points. If P lie on the x - axis , such that $AP = \frac{3}{7}AB$, Find the coordinate of P.

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11. Show that the point (11,2) is the centre of the circle passing through the points (1,2),(3,-4) and (5,-6).

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12. The radius of a circle with centre at origin is 30 units. Write the coordinates of the points where the circle intersects the axes. Find the distance between any two such points.

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Exercise 5 3

1. The centre of a cirlce is (-4,2) . If one end of the diameter of the circle is (-3,7) tehn find the other end.

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2. If the mid-point (x,y) of the line joining (3,4) and (p,7) lies on $2x + 2y + 1 = 0$, then what will be the value of p?

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3. The midpoint of the sides of a triangle are (2,4) (-2,3) and (5,2) .Find the corrdinate of the vertices of the triangle .

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4. O(0,0) is the centre of a circle whose one chord is AB, where the points A and B are (8,6) and (10,0) respectively. OD is the perpendicular form the centre of the chord AB. Find the coordinates of the midpoint of OD.

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5. The points A(-5,4), B(-1,-2) and C(5,2) are the vertices of an isosceles right angled trinagle where the right angle is at B. Find the corrdinates of D so that ABCD is a square .

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6. The points A(-3,6), B(0,7) and C(1,9) are the mid points of the sides DE, EF and FD of a triangle DEF. Show that the quadrilateral ABCD is a parallellogram.

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7. A(-3,2),B(3,2) and C(-3,-2) are the vertices of the right trinagle ,right angled at A. Show that the mid point of the hypotenus is equidistant form the vertices.

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Exercise 5 4

1. Find the coordinate of the point of the point which divides the line segment joining the points A(4,-3) and B(9,7) in the ratio 3:2.

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2. In what ratio does the point P(2,-5) divide the line segment joining A(-3,5) and B(4,-9).

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3. Find the coordinate of a point P on the line segment joinig A(1,2) and B(6,7) in such a way that $AP = \frac{2}{5}$ AB.

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4. Find the corrdinate of the points of trisection of the line segment joining the points A (-5,6) and B(4,-3).

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5. The line segment joining A(6,3) and B(-1,-4) is doubled in length by adding half of AB to each . Find the coordinates of the new end points .

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6. Using section formula , show that the points A(7,-5),B(9,-3) and C(13,1) are colliner.

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7. A line segment AB is increased along its length by 25% by producing it to C on the side of B. If A and B have the coordinates (-2,-3) and (2,1) respectively ,then find the coordinates of C.

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Exercise 5 5

1. Find the centroid of the triangle whose vertices are

(i) (2,-4), (-3,-7) and (7,2)

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2. If the centroid of a triangle is at (4,-2) and two of its vertices are (3,-2) an (5,2) then find the third vertex of the triangle .

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3. Find the length of median through A of a triangle whose vertices are A(-1,-3),B(1,-1) and C(5,1).

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4. The vertices of a triangle are (1,2), (h-3), and (-4,k). If the centroid of triangle is at the points (5,-1) then find the value of $\sqrt{(h+k)^2+(h+3k)^2}$

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5. Orthocentre and centroid of a triangle are A(-3,5) and B(3,3) respectively. If C is the circumcentre and AC

is the diameter of this circle, then find the radius of the circle.

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6. ABC is a triangle whose vertices are A(3,4) B(-2,-1) and C(5,3). If G is the centroid and BDCG is a parallelogram then find the coordinates of the vertex D.

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7. If $\left(\frac{3}{2}, 5\right)\left(7, \frac{-9}{2}\right)$ and $\left(\frac{13}{2}, \frac{-13}{2}\right)$ are mid points of the sides of a triangle, then find the centroid

of the triangle.

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Exercise 5 6

1. If the y - coordinate of a point is zero, then the point always lies_____.

A. in the I quadrant

B. in the II quadrant

C. on x-axis

D. on y-axis

Answer: on x-axis

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2. The point (-5,2) and (2,-5) lie in the _____.

A. same quadrat respectively

B. II and III quadrant respectively

C. II and IV quadrant respectively

D. IV and II quadrant respectively

Answer: II and IV quadrant respectively

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3. On plotting the points $O(0, 0), A(3, -4), B(3, 4)$ and $C(0, 4)$ and joining OA, AB ,BC and CO, which of the following figure is obtained?

A. square

B. Rectangle

C. Trapezium

D. Rhombus

Answer: Trapezium

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4. If P(-1,-1),Q(3,-4), R(1,-1),S(-2,-3) and T(-4,4) are plotted on a graph paper , then the point in the fourth quardant are _____.

A. P and T

B. Q and R

C. only S

D. P and Q

Answer: Q and R

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5. The point whose ordinate is 4 and which lies on the y -axis is _____.

A. (4,0)

B. (0,4)

C. (1,4)

D. (4,2)

Answer: (0,4)

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6. The distance between the two points (2,3) and (1,4) is .....

A. 2

B. $\sqrt{56}$

C. $\sqrt{10}$

D. $\sqrt{2}$

Answer: $\sqrt{2}$

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7. If the points $A(2, 0), B(-6, 0), C(3, a-3)$ lie on the x-axis then the value of a is .....

A. 0

B. 2

C. 3

D. -6

Answer: 3

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8. If $(x+2, 4) = (5, y, -2)$, then the coordinates (x,y) are .....

A. (7,12)

B. (6,3)

C. (3,6)

D. (2,1)

Answer: (3,6)

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9. If Q_1, Q_2, Q_3, Q_4 are the quadrants in a Cartesian plane then $Q_2 \cap Q_3$ is _____.

A. $Q_1 \cup Q_2$

B. $Q_2 \cup Q_3$

C. Null set

D. Negative x-axis

Answer: Null set

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10. The distance between the point (5,-1) and the origin is .....

A. $\sqrt{24}$

B. $\sqrt{37}$

C. $\sqrt{26}$

D. $\sqrt{17}$

Answer: $\sqrt{26}$

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11. The coordinates of the ponit C dividing the line segment joining the point P(2,4) abd Q(5,7) internally in the ratio 2 :1.

A. $\left(\frac{7}{2}, \frac{11}{2}\right)$

B. (3,5)

C. (4,4)

D. (4,6)

Answer: (4,6)

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12. If P $\left(\frac{a}{2}, \frac{b}{2}\right)$ is the mid point of the line segement joining $A(4-3)$ and $B(-2,4)$ them (a,b) is .....

A. $(-9,7)$

B. $\left(-3, \frac{7}{2}\right)$

C. $(9,-7)$

D. $\left(3,-\frac{7}{2}\right)$

Answer:

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13. In what ratio does the point Q(1,6) divide the line segment joining the points P(2,7) and R(-2,3).

A. $1:2$

B. $2:1$

C. $1:3$

D. $3:1$

Answer:

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14. If the coordinate of one end of a diameter of a circle is (3,4) and the coordinates of its centre is (-3,2) then the coordinate of the other end of the diameter is .

A. $(0, -3)$

B. $(0, 9)$

C. $(3, 0)$

D. $(-9, 0)$

Answer:

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15. The ratio in which the x-axis divides the line segment joining the points $A(a_1, b_1)$ and $B(a_2, b_2)$ is

A. $b_1 : b_2$

B. $-b_1 : b_2$

C. $a_1 : a_2$

D. $-a_1 : a_2$

Answer:

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16. The ratio in which the x-axis divides the line segment joining the points (6,4) and (1,-7) is .

A. $2:3$

B. $3:4$

C. $4:7$

D. $4:3$

Answer:

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17. If the coordinate of the mid - point of the sides AB, BC and CA of a trinagle are (3,4) (1,1) and (2,-3) respectively , then the vertice A and B of the triangle are .

A. $(3, 2), (2, 4)$

B. $(4, 0), (2, 8)$

C. $(3, 4), (2, 0)$

D. $(4, 3), (2, 4)$

Answer:

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18. The mid-point of the line joining (-a, 2b) and (-3a, -4b) is

A. $(2a, 3b)$

B. $(-2a, -b)$

C. $(2, ab)$

D. $(-2a, 3b)$

Answer:

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19. In what ratio does the y-axis divides the line joining the point (-5,1) and (2,3) internally.

A. $1:3$

B. $2:5$

C. $3:1$

D. $5:2$

Answer:

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20. If (1,-2),(3,6),(x,10) and (3,2) are the vertices of the parallelogram taken in order , then the value of x is .

A. 6

B. 5

C. 4

D. 3

Answer:

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Additional Questions Multiple Choice Questions

1. On which quadrant does the point (-4,3) lie ?

A. I

B. II

C. III

D. IV

Answer:

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2. The point whose abscissa is 5 and lies on the a x-axis is .....

A. (-5,0)

B. (5,5)

C. (0,5)

D. (5,0)

Answer:

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3. A point which lies in the III quadrant is.....

A. (5,4)

B. (5,-4)

C. (-5,-4)

D. (-5,4)

Answer:

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4. A pint on the y-axis is .....

A. (1,1)

B. (6,0)

C. (0,6)

D. (-1,-1)

Answer:

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5. The distance between the points (4,-1) and the origin is .....

A. $\sqrt{24}$

B. $\sqrt{37}$

C. $\sqrt{26}$

D. $\sqrt{17}$

Answer:

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6. The distance between the points (1,-2) and (3,2) is .....

A. $\sqrt{14}$

B. $\sqrt{15}$

C. 4

D. 20

Answer: D

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7. The centre of a circle is (0,0). One end point of a diameter is (5,-1) then the radius is .....

A. $\sqrt{24}$

B. $\sqrt{37}$

C. $\sqrt{26}$

D. $\sqrt{17}$

Answer: B

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8. The point (0,-3) is lies on .....

A. $+ve$ x-axis

B. $+ve$ y-axis

C. $-ve$ x-axis

D. $-ve$ y-axis

Answer: A

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9. The poit which is on y-axis with ordinate -5 is ....

A. (0,-5)

B. (-5,0)

C. (5,0)

D. (0,5)

Answer:

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10. The diagonal of a square formed by the points (1,0) (,0,1) (-1,0) and (0,-1) is .....

A. 2

B. 4

C. $\sqrt{2}$

D. 8

Answer: B

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11. The distance between the points (-2,2) and (3,2) is.....

A. 10 units

B. 5 units

C. $5\sqrt{3}$ units

D. 20 units

Answer:

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12. The mid point of the line joining thepoints (1,-1) and (-5,3) is .....

A. (2,1)

B. (3,-2)

C. (-2,-1)

D. (-2,1)

Answer: A::B

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13. If the centroid of a triangle is at (1,3) and two of its vertices are (7,-6) and (8,5) then the third is.....

A. (-2,2)

B. (2,-2)

C. (-2,,-2)

D. (-12,10)

Answer: D

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14. The ratio in which the x-axis divides the line segment joining the points (6,4) and (1,-7) is .

A. $1:2$

B. $2:3$

C. $4:7$

D. $7:4$

Answer: D

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15. The centroid of a triangle $(3, -5), (-7, 4)$ and $(10, -2)$ is.....

A. (2,-1)

B. (2,1)

C. (-2,1)

D. (1,-2)

Answer: A::B

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Additional Questions Answer The Following Questions

1. Show that the given points (1,1) ,(5,4) and (-2,5) are the vertices of an isosceles right angled triangle.

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2. Show that the point (3,-2),(3,2),(-1,2) and (-1,-2) taken in order are the vertices of a square.

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3. Show that the point $A(3, 7) B(6, 5)$ and $C(5, -1)$ are collinear.

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4. Find the type of triangle formed by (1,-1), (1,1) and $(-\sqrt{3}, \sqrt{3})$

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5. Find x such that PQ=QR where $P(6, -1) Q(1, 3)$ and $R(x, 8)$ respectively.

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6. Find the coordinates of the point of trisection of the line segment joining (4,-1) and (-2,3)

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7. Find the ratio of which the line segment joining the points (-3,10) and (6,8) is divided by (-1,6).

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Assignment Fill In The Blanks

1. The abscissa of the origin is ....

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2. The ordinate of the point (-5,3) is....

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3. The ordinate of every point on the x-axis is.....

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4. The abscissa of every point on y-axis is .....

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5. The axis intersect at a point called.....

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Assignment Choose The Correct Answer

1. The mid point of the line joining (a,-b) and (3a, 5b) is .....

A. (-a,2b)

B. (2a,4b)

C. (2a,2b)

D. (-a,3b)

Answer: C

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2. The centre of a circle is at (-6,4). If one end of a diameter of the circle is at the origin then the other ends is .....

A. (12,-8)

B. (12,0)

C. (0,-8)

D. (-12,8)

Answer: D

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3. The centroid of the triangle whose vertices are (3,-5), (-7,4) and (10,-2) is.....

A. (-2,1)

B. (2,-1)

C. (1,-2)

D. (2,1)

Answer: B

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4. The point P which divides the line segment joining the point $A(1, -3)$ and $B(-3, 9)$ internally in the ratio $1:3$ is .....

A. (2,1)

B. (0,0)

C. `((5)/(3),-2)

D. (1,-2)

Answer: B

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5. If the line segment joining the point A(3,4) and B(14,3) meets the X-axis at P, then the ratio in which P divides the segment AB is.....

A. $4:3$

B. $3:4$

C. $2:3$

D. $4:1$

Answer: A

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6. If (1,2) ,(4,6) (x,6) and (3,2) are the vertics of aparallelogram taken in order, the value of x is .....

A. 1

B. 2

C. 3

D. 6

Answer: D

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7. The centroid of the triangle is (2,2) the two vertices are (-2,-5) and (-2,12) then the third vertices is .....

A. (-1,10)

B. (10,-1)

C. (-10,1)

D. (1,-10)

Answer: B

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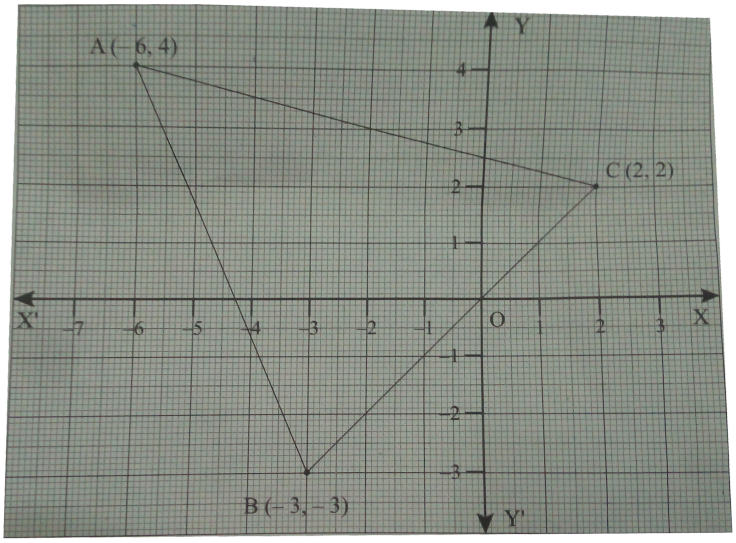
Assignment Answer The Following Questions

1. Read the coordinates of the vertices of the triangle ABC with the following figure.



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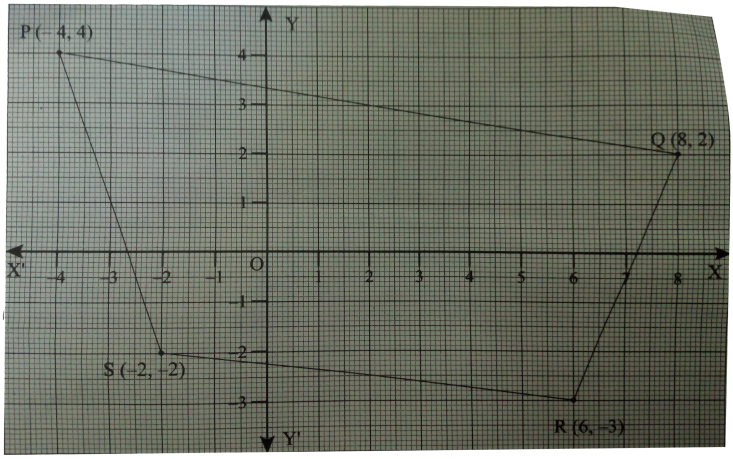
2. Write the coordinates of quadrilateral PQRs as shown in the following figure.



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3. Three vertices of a rectangle are (3,2),(-4,2) and (-4,5). Plot the points and find the coordinates of the fourth vertex.

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4. Prove that the points (0,0) $\left(3, \sqrt{3}\right)$ and $\left(3, -\sqrt{3}\right)$ are the vertices of an equilateral triangle.

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5. Show that the points (-3,0), (1,2), (5,-6) and (1,-8) taken in order to form a rectangle.

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6. Find the coordinates of the point which divides the line segment joining (-3,5) and (4,-9) in the ratio $1:6$ internally.

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7. If $A(-6, -6)$ and $B(-6, 4)$ be two points that a point P on the line AB satisfies $AP = 2/9AB$. find the point P

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8. Find the point of trisection of the line segment joinig the points $A(2, -2)$ and $B(-7, -4)$.

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9. In what ratio is the line joinig the points (-5,1) and (2,3) divided by the Y-axis ? Also find the point of intersection.

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10. Find the length of the medians of the triangle whose vertices are $(1, -1), (0, 4)$ and $(-5, 3)$

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Textbook Activity

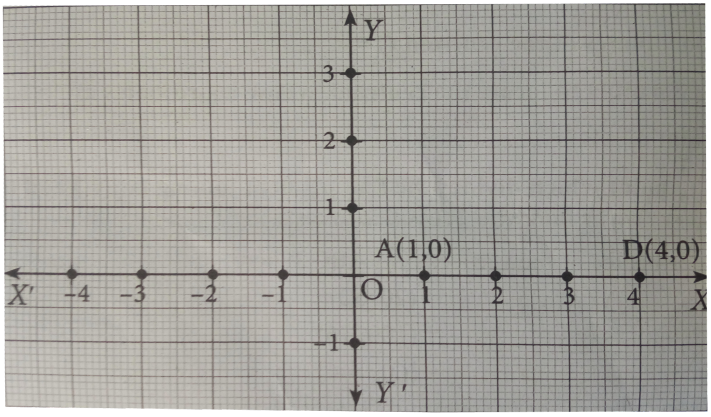
1. Plot the following points on a graph sheet by taking the scale as 1cm=1 unit.

Find how far the points are from each other?

A(1,0) and D(4,0). Find AD and also DA.

Is AD=DA?

You plot another set of points and verify your Result.



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2. Plot the points $A(1, 0), B(-7, 2), C(-3, 7)$ on a graph sheet and join them to form a triangle.

Plot the point G(-3,3).

Join AG and extend it to intersect BC at D.

Join BG and extend it to intersect AC at E.

What do you infer when you measure the distance between BD and DC and the distance between CE and EA?

Using distance formula find the lengths of CG and GF, where F in on AB.

Write your inference about AG:GD, BG:GE and CG:GF,

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