Q. 1 Let $A(4,2), B(6,5)$ and $C(1,4)$ be the vertices of $\triangle \mathrm{ABC}$.
(i) The median from A meets BC at D. Find the coordinates of point $D$.
(ii) Find the coordinates of the point $P$ on $A D$ such that $\mathrm{AP}: ~ P D=2: 1$.
(iii) Find the coordinates of point $\mathbf{Q}$ and $\mathbf{R}$ on medians $B E$ and $C F$ respectively such that $B Q$ : $\mathrm{QE}=2: 1$ and $\mathrm{CR}: \mathrm{RF}=2: 1$.
(iv) What do you observe?
(v) If $\mathrm{A}\left(x_{1}, y_{1}\right), \mathrm{B}\left(x_{2}, y_{2}\right)$, and $\mathrm{C}\left(x_{3}, y_{3}\right)$ are the vertices of $\triangle \mathrm{ABC}$, find the coordinates of the centroid of the triangle.

Find the centre of a circle passing through the points $(6,-6),(3,-7)$ and $(3,3)$.
Q. 3 The two opposite vertices of a square are (-1, - 2) and (3, 2). Find the coordinates of the other two vertices.
Q. 4

Find the ratio in which the line segment joining $A(1,-5)$ and $B(-4,5)$ is divided by the $x$-axis. Also find the coordinates of the point of division.
Q. 5 You have studied in Class IX that a median of a triangle divides it into two triangles of equal areas. Verify this result for $\triangle \mathrm{ABC}$ whose vertices are $A(4,-6), B(3,-2)$ and $C(5,2)$.
Q. 6

To conduct Sports Day activities, in your rectangular shaped school ground ABCD , lines have been drawn with chalk powder at a distance of 1 m each. 100 flower pots have been placed at a distance of 1 m from each other along AD , as shown in the following figure. Niharika runs $\frac{1}{4}^{\text {th }}$ the distance AD on the $2^{\text {nd }}$ line and posts a green flag. Preet
runs $\frac{1}{5}^{\text {th }}$ the distance $A D$ on the eighth line and posts a red flag. What is the distance between both the flags? If Rashmi has to post a blue flag exactly halfway between the line segment joining the two flags, where should she post her flag?


If $(1,2),(4, y),(x, 6)$ and $(3,5)$ are the vertices of a parallelogram taken in order, find $x$ and $y$.

Check whether $(5,-2),(6,4)$ and $(7,-2)$ are the vertices of an isosceles triangle.

Find the coordinates of the point which divides the join of $(-1,7)$ and $(4,-3)$ in the ratio $2: 3$.
$\overline{\text { Q. } 10}$ If $(1,2),(4, y),(x, 6)$ and $(3,5)$ are the vertices -_ of a parallelogram taken in order, find $x$ and $y$.
Q. 11 Find a relation between $x$ and $y$ if the points - $(x, y),(1,2)$ and $(7,0)$ are collinear.
$\overline{\text { Q. } 12}$ In each of the following find the value of ' $k$ ', - for which the points are collinear.
(i) $(7,-2),(5,1),(3,-k)$
(ii) $(8,1),(k,-4),(2,-5)$
Q. 13 Find the area of a rhombus if its vertices are - $(3,0),(4,5),(-1,4)$ and $(-2,-1)$ taken in order. [Hint: Area of a rhombus

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## WEEKLY TEST CLASS-X

$=\frac{1}{2}$ (product of its diagonals)]
Q. 14 In a classroom, 4 friends are seated at the points $A, B, C$ and $D$ as shown in the following figure. Champa and Chameli walk into the class and after observing for a few minutes Champa asks Chameli, "Don't you think ABCD is a square?" Chameli disagrees. Using distance formula, find which of them is correct.

Q. 15 Find the coordinates of the points which divide the line segment joining $A(-2,2)$ and $B(2,8)$ into four equal parts.
Q. 16 Find the area of the triangle formed by joining the mid-points of the sides of the triangle whose vertices are $(0,-1),(2,1)$ and $(0,3)$. Find the ratio of this area to the area of the given triangle.
Q. 17 The vertices of a $\triangle \mathrm{ABC}$ are $\mathrm{A}(4,6), \mathrm{B}(1,5)$ and $C(7,2)$. A line is drawn to intersect sides $A B$ and $A C$ at $D$ and $E$ respectively, such that . Calculate the area of the $\triangle \mathrm{ADE}$ and compare it with the area of $\triangle \mathrm{ABC}$. (Recall Converse of basic proportionality theorem and Theorem 6.6 related to ratio of areas of two similar triangles).
Q. 18 Find the point on the $\boldsymbol{x}$-axis which is equidistant from $(2,-5)$ and $(-2,9)$.
$\overline{\text { Q. } 19}$ Find the area of the triangle whose vertices - are:
(i) $(2,3),(-1,0),(2,-4)$
(ii) $(-5,-1),(3,-5),(5,2)$
$\overline{Q .20}$ The vertices of a $\triangle \mathrm{ABC}$ are $\mathrm{A}(4,6), \mathrm{B}(1,5)$ - and $C(7,2)$. A line is drawn to intersect sides $A B$ and $A C$ at $D$ and $E$ respectively, such that $\frac{A D}{A B}=\frac{A E}{A C}=\frac{1}{4}$.

Calculate the area of the $\triangle \mathrm{ADE}$ and compare it with the area of $\triangle \mathrm{ABC}$.

