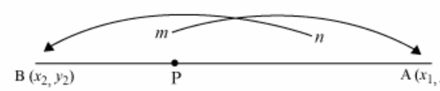
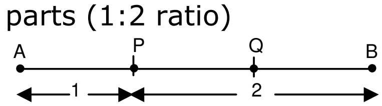
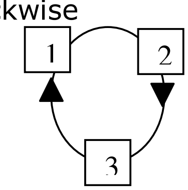
Common Mistakes and How to avoid

X–Math

Chapter: Coordinate Geometry

Types of Question	**Common Mistakes**	**Points to be emphasised**
Questions based on distance formula	Error while substituting the coordinate points.	In the ordered pair (a, b) order is important coordinate a represent x coordinate and b represent y coordinate Crosscheck whether you have correctly substituted the coordinates.
	Mistake while calculating the distance between two points.	-Revise the formulae Do not perform many steps at a time. Solve systematically. i.e to compute distance between two points: ▪ Substitute the values in formula. ▪ Subtract ▪ Square ▪ Add ▪ Take square root
	Error in interpretation of the condition. ▪ Vertices of right triangle ▪ Vertices of square (forget to show that both the diagonals are equal) ▪ Circum centre ▪ Vertices of rectangle (forgets to show that angle between two sides is 90^0)	You should know the conditions: ▪ **Vertices of right triangle**: sides satisfy Pythagoras theorem. ▪ **Vertices of square**: All sides & both the diagonals are equal. ▪ **Circum centre**: Distance between circum centre & point on circle is radius. ▪ **Vertices of rectangle**: Opposite sides are equal & satisfies Pythagoras theorem (angle =90degree) Or diagonals are also equal
Questions based on section	Error in substitution	Remember the formula correctly.

formula	$\left(\frac{mx_1(\text{in place of } x_2)+nx_2(\text{in place of } x_1)}{m+n}, \frac{my_1(\text{in place of } y_2)+ny_2(\text{in place of } y_1)}{m+n}\right)$	Coordinates of points P, dividing the line segment joining $A(x_1,y_1)$ & $B(x_2,y_2)$ internally in the ratio m:n $\left(\frac{mx_2+nx_1}{m+n}, \frac{my_2+ny_1}{m+n}\right)$ m with point A & n with point B  On the other hand if Coordinates of points P, dividing the line segment joining $B(x_2,y_2)$ & $A(x_1,y_1)$ internally in the ratio m:n then use 
	Error in interpretation of the condition. ▪ Line segment bisected ▪ Line segment trisected (ratio of 1:2 not 1:3) ▪ Centroid of triangle	You should remember: **Bisection** means line segment divided into two equal parts & the coordinates of midpoints are: $\left(\frac{x_2+x_1}{2}, \frac{y_2+y_1}{2}\right)$ **Trisection** means line segment divided into 3 equal parts (1:2 ratio)  Find coordinates of point P (divided into 1:2) ratio. Now, find coordinates of point Q by applying section formula with ratio 2:1(PB divided into 1:1 ratio by point Q) **Centroid of a triangle** Centroid divided the median in a ratio of 2:1 & coordinates of centroid are:

		$\left(\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3}\right)$ Use section formula to solve such question: 1. Taking ratio p : 1 and finding the ratio 2. Find the value of 'k'
Area of Triangle	Forget to put $\frac{1}{2}$ in the formula Use Incorrect formula Forget to take absolute value	Remember the formula correctly. Compute Area by: $\text{Area} = \frac{1}{2}[x_1(y_2 - y_3) + x_2(y_3 - y_1)$ $+ x_3(y_1 - y_2)]$ Always remember that the coordinate points are rotating clockwise  (1→2→3)1st term, (2→3→1) 2nd term & (3→1→2) 3rd term. Also area of a region is always a positive quantity and hence absolute value must be taken.
	Error in interpretation of condition: 1. Area of a quadrilateral (Area quad ABCD =Sum of area of triangles)	You should remember: To avoid confusion, For quad ABCD, Join either point A & C or B & D (not both) Compute Area of triangle separately & then add.
Short Methods	• For proving the vertices to represent parallelogram • Finding the value of k for which the three points are collinear. • Proving the points to represent collinear	• To prove that a quadrilateral with given vertices is a parallelogram using , prove that the diagonals bisect each other can be done by finding the mid-points of the two diagonals separately and proving that both are same. If three vertices of a parallelogram are given and it

	points	is asked to find the fourth vertex, again use the fact that both the diagonals have the same mid-point. Remember that all other methods are lengthy. • Students use distance formula or section formula for doing questions based on collinear points which involves lengthy calculations unless or until specified use the fact that area of triangle formed by collinear points is zero.