10.10 IMPORTANT TIPS

- If three points *A*, *B*, *C* are collinear, then
  Slope of *AB* = Slope of *BC* = Slope of *AC*.
- Equation of *x*-axis $\Rightarrow y = 0$.
  Equation a line parallel to *x*-axis (or perpendicular to *y*-axis) at a distance '*b*' from it $\Rightarrow y = b$.
- Equation of *y*-axis $\Rightarrow x = 0$
  Equation of a line parallel to *y*-axis (or perpendicular to *x*-axis) at a distance '*a*' from it $\Rightarrow x = a$.
- Area of the triangle formed by the lines $y = m_1x + c_1$, $y = m_2x + c_2, y = m_3x + c_3$ is $\frac{1}{2}\left|\Sigma\frac{(c_1 - c_2)^2}{m_1 - m_2}\right|$.
- Area of the triangle made by the line $ax + by + c = 0$ with the co-ordinate axes is $\frac{c^2}{2|ab|}$.
- Area of the rhombus formed by the lines $ax \pm by \pm c = 0$ is $\left|\frac{2c^2}{ab}\right|$.
- Area of the parallelogram formed by the lines $a_1x + b_1y + c_1 = 0$; $a_2x + b_2y + c_2 = 0$, $a_1x + b_1y + d_1$ and $a_2x + b_2y + d_2 = 0$ is $\left|\frac{(d_1 - c_1)(d_2 - c_2)}{a_1b_2 - a_2b_1}\right|$.
- The foot of the perpendicular (h,k) from (x_1, y_1) to the line $ax + by + c = 0$ is given by $\frac{h - x_1}{a} = \frac{k - y_1}{b} = \frac{-(ax_1 + by_1 + c)}{a^2 + b^2}$. Hence, the coordinates of the foot of perpendicular is $\left(\frac{b^2x_1 - aby_1 - ac}{a^2 + b^2}, \frac{a^2y_1 - abx_1 - bc}{a^2 + b^2}\right)$.
- Area of parallelogram $A = \frac{p_1p_2}{\sin}$, where p_1 and p_2 are the distances between parallel sides and $^-$ is the angle between two adjacent sides.
- The equation of a line whose mid-point is (x_1, y_1) in between the axes is $\frac{x}{x_1} + \frac{y}{y_1} = 2$.
- The equation of a straight line which makes a triangle with the axes of centroid (x_1, y_1) is $\frac{x}{3x_1} + \frac{y}{3y_1} = 1$.