Length of Perpendicular.

(1)**Distance of a point from a line:** The length p of the perpendicular from the point (x_1, y_1) to the line $ax + by + c = 0$ is given by $p = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$.

Note: Length of perpendicular from origin to the line $ax + by + c = 0$ is $\frac{c}{\sqrt{a^2 + b^2}}$.

Length of perpendicular from the point (x_1, y_1) to the line $x\cos\alpha + y\sin\alpha = p$ is $x_1\cos\alpha + y_1\sin\alpha - p$

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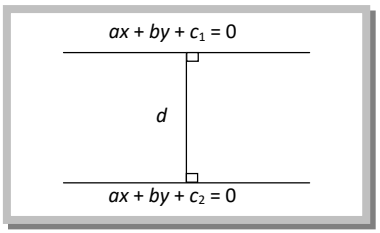
(2)**Distance between two parallel lines:** Let the two parallel lines be $ax + by + c_1 = 0$ and $ax + by + c_2 = 0$.

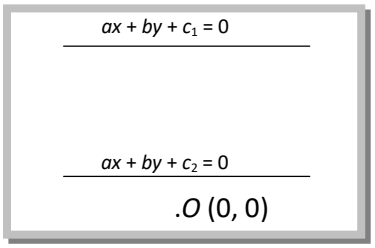
First Method: The distance between the lines is $d = \frac{|c_1 - c_2|}{\sqrt{(a^2 + b^2)}}$.



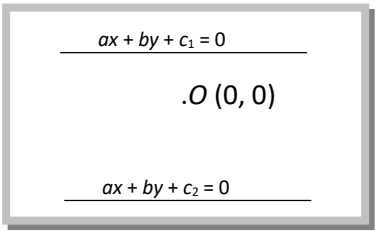
Second Method: The distance between the lines is $d = \frac{\lambda}{\sqrt{(a^2 + b^2)}}$, where

(i) $\lambda = |c_1 - c_2|$ if they be on the same side of origin.

(ii) $\lambda = |c_1| + |c_2|$ if the origin O lies between them.



Third method: Find the coordinates of any point on one of the given line, preferably putting $x = 0$ or $y = 0$. Then the perpendicular distance of this point from the other line is the required distance between the lines.



Note:: Distance between two parallel lines $ax + by + c_1 = 0$ and $kax + kby + c_2 = 0$ is $\frac{\left| c_1 - \frac{c_2}{k} \right|}{\sqrt{a^2 + b^2}}$

Distance between two non-parallel lines is always zero.