ASSIGNMENT 2

Question : Two lines passing through the point(2,3) intersect each other at an angle of 60°.If slope of one line is 2,find equation of the other line.

Solution :

Symbol	Description	Value
m_1	Slope of one line	2
m_2	Slope of other line	m_2
θ	Angle between two lines	60°
P	Intersecting point	$\begin{pmatrix}2\\3\end{pmatrix}$

Table 1: Table of input parameters

Symbol	Description	Value
$\tan\theta$	Slope between two lines	$\frac{m_1-m_2}{1+m_1m_2}$

Table 2: Table of output parameters

So,

$$\tan 60^\circ = \sqrt{3} = \left|\frac{2-m_2}{1+2m_2}\right| \tag{1}$$

$$\implies m_2 = \frac{2-\sqrt{3}}{2\sqrt{3}+1} \tag{2}$$

$$or, = -\frac{\left(2+\sqrt{3}\right)}{2\sqrt{3}-1} \tag{3}$$

So,the equation of the line is

$$(y-3) = \frac{2-\sqrt{3}}{2\sqrt{3}+1}(x-2) \tag{4}$$

$$or, (y-3) = -\frac{(2+\sqrt{3})}{2\sqrt{3}-1}(x-2) \tag{5}$$

Figure :

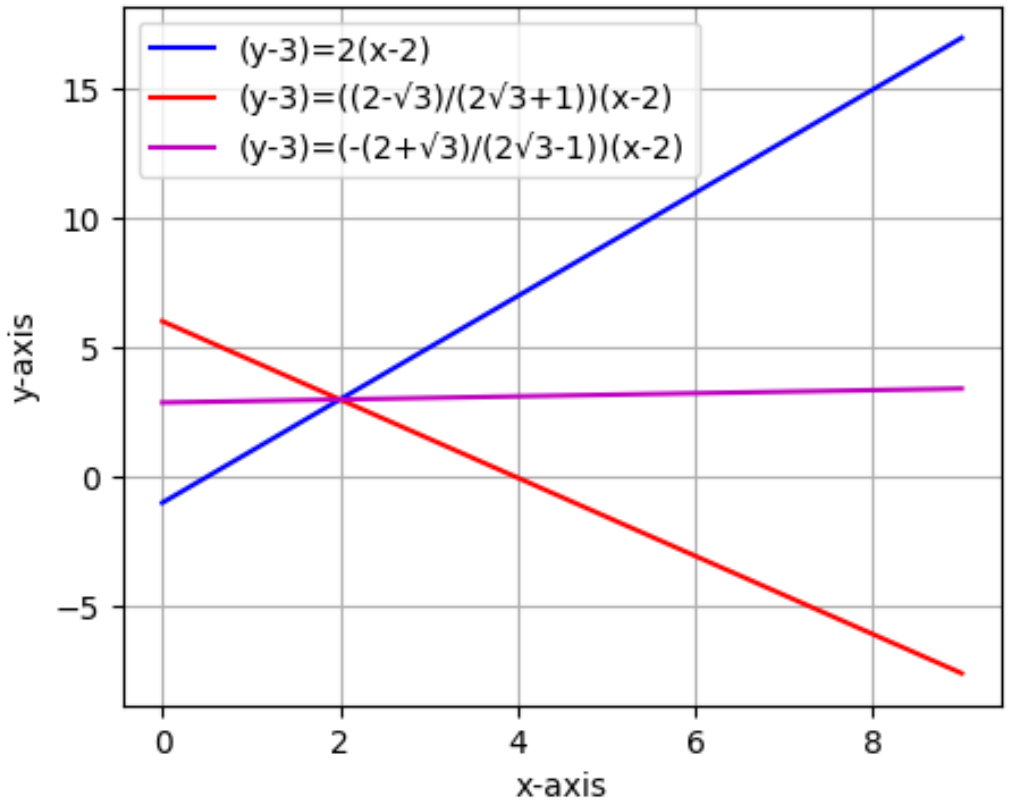

Figure 1: Required Figure