Answer on Question #75081 - Subject – Algebra

Given: The equation of line $y = 2x + 2$ and a point $(4, 7)$ on a line which is perpendicular on $y = 2x + 2$.

To Find: Find the equation of 2nd line.

Solution: The given equation of line is $y = 2x + 2$

On comparing with the equation of line $y = mx + c$ (slope form)

Slope of the line $m_1 = 2$

Now, we know that if two lines are perpendicular than

$$m_1 m_2 = -1 \qquad \Rightarrow \qquad m_2 = -1/2$$

So, the equation of second line will be

$$y = m_2 x + c \qquad \Rightarrow \qquad y = \left(\frac{-1}{2}\right) x + c$$

$\because$ The 2nd line passes through (4,7)

$$\therefore \qquad y = \left(\frac{-1}{2}\right) x + c \qquad \qquad \Rightarrow \qquad 7 = \left(\frac{-1}{2}\right) 4 + c$$

$$\Rightarrow \qquad 7 = -2 + c$$

$$\Rightarrow \qquad c = 9$$

Hence, the equation of line will be $y = \left(\frac{-1}{2}\right) x + 9$.