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5.3

① a) $\cancel{2}y = \frac{3x-5}{\cancel{2}}$

$$y = \frac{3}{2}x - \frac{5}{2}$$

$$m = \left(\frac{3}{2}\right)$$

$$6x - 4y + 11 = 0$$

$$\cancel{4}y = \frac{6x+11}{\cancel{4}}$$

$$y = \frac{3}{2}x + \frac{11}{4}$$

$$m = \left(\frac{3}{2}\right)$$

They're both parallel

b) $3x - 4y + 9 = 0$

$$\cancel{4}y = \frac{3x+9}{\cancel{4}}$$

$$y = \frac{3}{4}x + \frac{9}{4}$$

$$m = \left(\frac{3}{4}\right)$$

$$9x + 12y - 10 = 0$$

$$\cancel{12}y = \frac{-9x+10}{\cancel{12}}$$

$$y = -\frac{3}{4}x + \frac{5}{6}$$

$$m = \left(-\frac{3}{4}\right)$$

They're not parallel

c) $5x + 2y - 15 = 0$

$$\cancel{2}y = -\frac{5x-15}{\cancel{2}}$$

$$y = -\frac{5}{2}x + \frac{15}{2}$$

$$m = \left(-\frac{5}{2}\right)$$

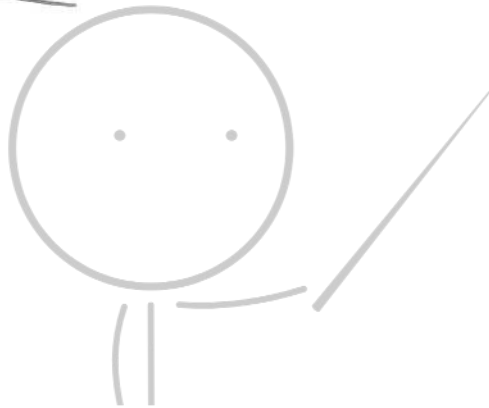
$$10x + 4y + 9 = 0$$

$$4y = -\frac{10x+9}{4}$$

$$y = -\frac{5}{2}x - \frac{9}{4}$$

$$m = \left(-\frac{5}{2}\right)$$

They're
both parallel



BF MATHS

$$\textcircled{2} \text{ a) } 3y = \frac{2}{3}x + \frac{7}{3}$$

$$y = \frac{2}{3}x + \frac{7}{3}$$

$$m = \left(\frac{2}{3}\right)$$

$$4x + 6y + 1 = 0$$

$$\frac{6y}{6} = -\frac{4x}{6} + \frac{1}{6}$$

$$y = -\frac{2}{3}x + \frac{1}{6}$$

$$m = \left(-\frac{2}{3}\right)$$

They're not perpendicular

$$\text{b) } 5x - 3y + 2 = 0$$

$$\frac{3y}{3} = \frac{5x}{3} + \frac{2}{3}$$

$$y = \frac{5}{3}x + \frac{2}{3}$$

$$m = \left(\frac{5}{3}\right)$$

$$\frac{3y}{3} = \frac{3x}{5} + \frac{6}{5}$$

$$y = \frac{3}{5}x + \frac{6}{5}$$

$$m = \left(\frac{3}{5}\right)$$

They're not perpendicular

$$\text{c) } 4x - y - 5 = 0$$

$$y = 4x - 5$$

$$m = \left(4\right)$$

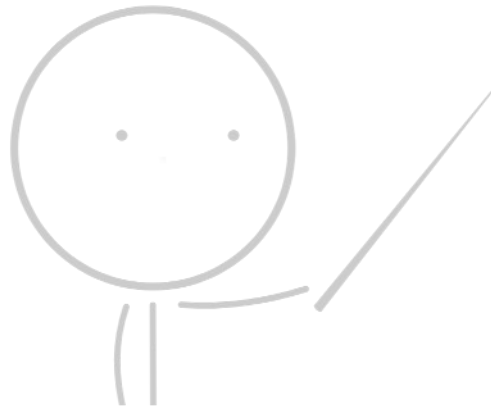
$$2x + 8y - 15 = 0$$

$$\frac{8y}{8} = -\frac{2x}{8} + \frac{15}{8}$$

$$y = -\frac{1}{4}x + \frac{15}{8}$$

$$m = \left(-\frac{1}{4}\right)$$

They're both perpendicular



BF MATHS

$$\textcircled{3} \quad 2x - 3y + 7 = 0$$

$$\frac{3y}{3} = \frac{2x+7}{3}$$

$$y = \frac{2}{3}x + \frac{7}{3}$$

$$m = \frac{2}{3}$$

$$y = \frac{2}{3}x + c$$

Substitute $(-3, 5)$

$$5 = \frac{2}{3}(-3) + c$$

$$\textcircled{x1} \quad c = 7 \quad \textcircled{x2}$$

$$y = \frac{2}{3}x + 7$$

$$\underline{\underline{3y = 2x + 21}}$$

$$\textcircled{4} \quad (1, -6) \text{ and } (-2, 9)$$

$$\frac{9 - (-6)}{-2 - 1} = \frac{15}{-3} = -5$$

$$m = -5$$

Substitute $(0, 0)$

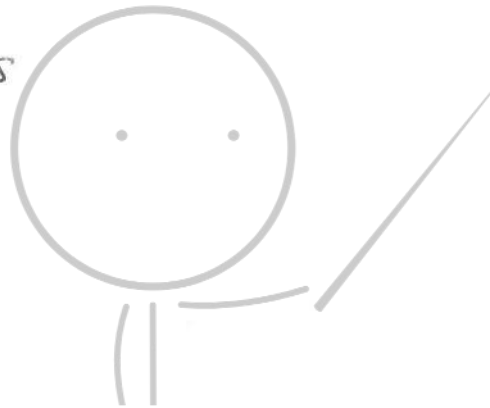
$$y = -5x + c$$

$$0 = -5(0) + c$$

$$c = 0$$

$$y = -5x$$

$$\underline{\underline{y + 5x = 0}}$$



BF MATHS

$$\textcircled{5} \quad 4y - 8 = 3x$$

$$\frac{4y}{4} = \frac{3x+8}{4}$$

$$y = \frac{3}{4}x + 2$$

Substitute x -coordinate 4

$$y = \frac{3}{4}(4) + 2$$

$$y = 5$$

$$P: (4, 5)$$

$$c2 = m = -\frac{4}{3}$$

$$y = -\frac{4}{3}x + c$$

Substitute P

$$5 = -\frac{4}{3}(4) + c$$

$$c = \frac{31}{3}$$

$$\textcircled{x3} \quad y = -\frac{4}{3}x + \frac{31}{3} \quad \textcircled{x3}$$

$$3y = -4x + 31$$

$$\underline{\underline{4x + 3y - 31 = 0}}$$

$$(6) a) 2y = 1 - 3x$$

substitute $P(3, -4)$

$$2(-4) = 1 - 3(3)$$

$$-8 = -8$$

$$b) m = \frac{2}{3}$$

$$y = \frac{2}{3}x + c$$

substitute P into $L_2(-3, 4)$

$$4 = \frac{2}{3}(-3) + c$$

$$c = 6$$

$$(x_1) y = \frac{2}{3}x + 6 \quad (x_3)$$

$$3y = \cancel{2x} + 18$$

$$\underline{\underline{2x - 3y + 18 = 0}}$$

$$(7) a) 2x - 5y + 2 = 0$$

$$\frac{5y}{5} = \frac{2x + 2}{5}$$

$$y = \frac{2}{5}x + \frac{2}{5}$$

$$\underline{\underline{m = \frac{2}{5}}}$$

$$b) m = -\frac{5}{2}$$

$$y = -\frac{5}{2}x + c$$

substitute $(3, 2)$

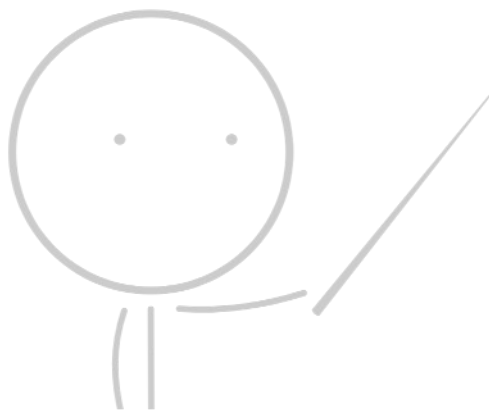
$$2 = -\frac{5}{2}(3) + c$$

$$c = \frac{19}{2}$$

$$(x_2) y = -\frac{5}{2}x + \frac{19}{2} \quad (x_2)$$

$$2y = -5x + 19$$

$$\underline{\underline{5x + 2y - 19 = 0}}$$



BF MATHS

$$(8) a) 5y - 2x - k = 0$$

$$\frac{5y}{5} = \frac{2x}{5} + \frac{k}{5}$$

$$y = \frac{2}{5}x + \frac{k}{5}$$

Substitute A(1, 3)

$$3 = \frac{2}{5}(1) + \frac{k}{5}$$

$$3 = \frac{2}{5} + \frac{k}{5}$$

$$\frac{13}{5} = \frac{k}{5}$$

$$\underline{\underline{k = 13}}$$

$$b) y = \frac{2x}{5} + \frac{13}{5}$$

$$m = \frac{2}{5}$$

$$c) L_2: m = -\frac{5}{2}$$

Substitute A(1, 3)

$$3 = -\frac{5}{2}(1) + c$$

$$c = \frac{11}{2}$$

$$^{(x_2)}y = -\frac{5}{2}x + \frac{11}{2} \quad ^{(x_2)}$$

$$2y = -5x + 11$$

$$\underline{\underline{5x + 2y - 11 = 0}}$$

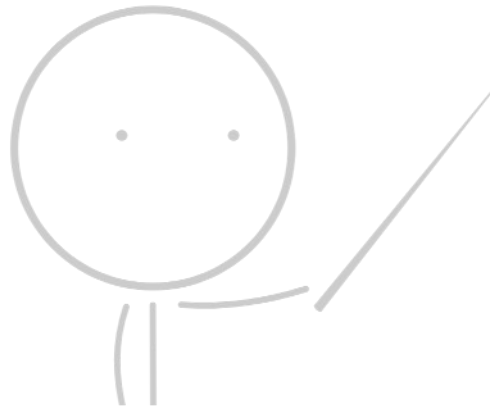
$$d) y = -\frac{5}{2}x + \frac{11}{2}$$

$$0 = -\frac{5}{2}x + \frac{11}{2}$$

$$\stackrel{\div 5/2}{-11} \frac{-11}{2} = -\frac{5}{2}x \div -\frac{5}{2}$$

$$x = \frac{11}{5}$$

$$\underline{\underline{\left(\frac{11}{5}, 0\right)}}$$



BF MATHS

$$(9) a) (-2, 3) \text{ P}, (10, 9) \text{ Q}$$

$$\frac{9-3}{10-(-2)} = \frac{1}{2}$$

$$y = \frac{1}{2}x + c$$

~~xxxx~~ substitute P(-2, 3)

$$3 = \frac{1}{2}(-2) + c$$

$$c = 4$$

$$y = \frac{1}{2}x + 4$$

$$b) L_2: m = -2$$

$$y = -2x + c$$

substitute R(12, 0)

$$0 = -2(12) + c$$

$$c = 24$$

$$y = -2x + 24$$

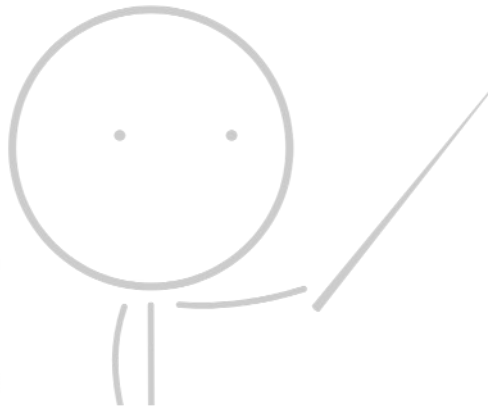
$$-2x + 24 = \frac{1}{2}x + 4$$

$$24 - 4 = \frac{1}{2}x + 2x$$

$$\stackrel{\pm 5/2}{=} 20 = \frac{5}{2}x \stackrel{\pm 2/5}{=}$$

$$x = 8$$

BF MATHS



Substitute x into either L_1 or L_2 :

$$y = \frac{1}{2}(8) + 4$$

$$y = 8$$

$$(8, 8)$$