

1) L parallel to $y = -2x + 1$
through $(5, 2)$

Gradient the same -2

Using $y - y_1 = m(x - x_1)$

$$y - 2 = -2(x - 5)$$

$$y - 2 = -2x + 10$$

$$y = -2x + 12$$

Cuts y -axis at $(0, 12)$

When $y = 0$, $0 = -2x + 12$
 $2x = 12$
 $x = 6$

Cuts x -axis at $(6, 0)$

2) line $3x + 5y = 12$

$$\Rightarrow 5y = -3x + 12$$

$$\Rightarrow y = -\frac{3}{5}x + \frac{12}{5}$$

$$\text{Gradient} = -\frac{3}{5}$$

Find where it crosses axes

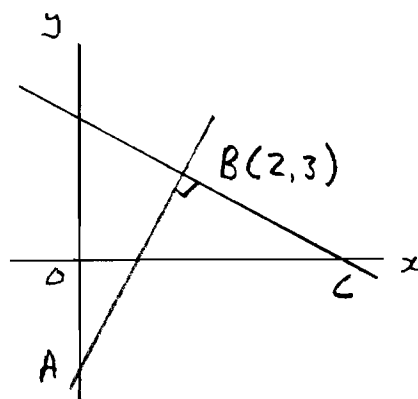
$$3x + 5y = 12$$

When $x = 0$, $5y = 12$, $y = \frac{12}{5}$

Cuts y -axis at $(0, \frac{12}{5})$

When $y = 0$, $3x = 12$, $x = 4$
Cuts x -axis at $(4, 0)$

3)



AB $y = 4x - 5$ through $(2, 3)$

Gradient is $+4$

Gradient of \perp line is $-\frac{1}{4}$

BC Using $y - y_1 = m(x - x_1)$

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

$$y - 3 = -\frac{1}{4}x + \frac{1}{2}$$

$$\text{BC } y = -\frac{1}{4}x + \frac{7}{2}$$

At C, $y = 0$

$$\Rightarrow 0 = -\frac{1}{4}x + \frac{7}{2}$$

$$\Rightarrow 0 = -x + 14$$

$$\Rightarrow x = 14$$

C $(14, 0)$

4) Line $3x + 2y = 6$
 Find parallel line through $(2, 10)$
 Line of form
 $3x + 2y = c$
 Sub $(2, 10)$
 $3(2) + 2(10) = c$
 $6 + 20 = c$
 $26 = c$
 Line is $3x + 2y = 26$

4) Alternative solution
 Line $3x + 2y = 6$
 $2y = -3x + 6$
 $y = -\frac{3}{2}x + 3$
 Parallel line has gradient $-\frac{3}{2}$
 Using $y - y_1 = m(x - x_1)$
 $y - 10 = -\frac{3}{2}(x - 2)$
 $y - 10 = -\frac{3}{2}x + 3$
 $y = -\frac{3}{2}x + 13$

5) Find line parallel to
 $y = 2x + 7$ through $(3, 10)$
 Parallel will also have gradient 2
 Using $y - y_1 = m(x - x_1)$
 $y - 10 = 2(x - 3)$
 $y - 10 = 2x - 6$
 $y = 2x + 4$

6) i) Find gradient of $4x + 5y = 24$
 $5y = -4x + 24$
 $y = -\frac{4}{5}x + \frac{24}{5}$
 Gradient = $-\frac{4}{5}$

ii) Line parallel to
 $4x + 5y = 24$
 is of form $4x + 5y = c$
 Sub $(0, 12)$
 $4(0) + 5(12) = c$
 $0 + 60 = c$
 $60 = c$
 Line is $4x + 5y = 60$
 On x-axis $y = 0$
 $4x + 0 = 60$
 $x = \frac{60}{4} = 15$
 Cuts x-axis at $(15, 0)$

7) i) Line $2x + 3y = 12$

When $x = 0$

$$0 + 3y = 12$$

$$y = \frac{12}{3} = 4$$

Cuts y-axis at $(0, 4)$

When $y = 0$

$$2x + 0 = 12$$

$$x = \frac{12}{2} = 6$$

Cuts x-axis at $(6, 0)$

7ii) $2x + 3y = 12$

$$3y = -2x + 12$$

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

$$\text{Gradient} = -\frac{2}{3}$$

8) Line through $(-1, -9)$ and $(3, 11)$

using

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$$\frac{y - -9}{11 - -9} = \frac{x - -1}{3 - -1}$$

$$\frac{y + 9}{20} = \frac{x + 1}{4}$$

$$y + 9 = \frac{20}{4}(x + 1)$$

$$y + 9 = 5(x + 1)$$

$$y + 9 = 5x + 5$$

$$y = 5x - 4$$

9) line has gradient -4 through $(2, 6)$

using $y - y_1 = m(x - x_1)$

$$y - 6 = -4(x - 2)$$

$$y - 6 = -4x + 8$$

$$y = -4x + 14$$

When $x = 0$, $y = 14$

Cuts y-axis at $(0, 14)$

When $y = 0$

$$0 = -4x + 14$$

$$4x = 14$$

$$x = \frac{14}{4} = \frac{7}{2}$$

Cuts x-axis at $(\frac{7}{2}, 0)$