

COORDINATE GEOMETRYEXERCISE 5D

①

8) $y = x$ ①

$y = 2x - 5$ ②

Sub for y in ②

$x = 2x - 5$

$5 = 2x - x$

$5 = x$

Sub for x in ①

$y = 5$

Intersect at $A(5, 5)$ Line with gradient $\frac{2}{5}$ through A

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

$y - 5 = \frac{2}{5}(x - 5)$

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

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

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

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

$y - -12 = \frac{2}{3}(x - 6)$

$y + 12 = \frac{2}{3}x - 4$

$y = \frac{2}{3}x - 16$

 P meets y axis when $x = 0$

$y = 0 - 16 = -16$

Meets y -axis at $A(0, -16)$

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

$y - 5 = -1(x - 5)$

$y - 5 = -x + 5$

$y = -x + 10$

 Q meets x -axis when $y = 0$

$0 = -x + 10$

$x = 10$

 Q meets x -axis at $B(10, 0)$

Gradient of $AB = \frac{y_2 - y_1}{x_2 - x_1}$

$= \frac{-16 - 0}{0 - 10} = \frac{-16}{-10}$

Gradient $AB = 1.6$

COORDINATE GEOMETRY

12)

$$y = 3x - 5$$

meets x-axis when $y = 0$

$$0 = 3x - 5$$

$$5 = 3x$$

$$\frac{5}{3} = x$$

$$\therefore M\left(\frac{5}{3}, 0\right)$$

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

meets y-axis when $x = 0$

$$y = 0 + \frac{2}{3} = \frac{2}{3}$$

$$\therefore N\left(0, \frac{2}{3}\right)$$

Line MN

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

$$\frac{y - 0}{\frac{2}{3} - 0} = \frac{x - \frac{5}{3}}{0 - \frac{5}{3}}$$

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

$$-\frac{5}{3}y = \frac{2}{3}\left(x - \frac{5}{3}\right)$$

$$-5y = 2\left(x - \frac{5}{3}\right)$$

$$-5y = 2x - \frac{10}{3}$$

$$-15y = 6x - 10$$

(2)

EXERCISE 5D

$$6x + 15y - 10 = 0$$

14) $y = 4x + 5$

meets y-axis when $x = 0$

$$y = 0 + 5 = 5$$

$$\therefore C(0, 5)$$

$$y = -3x - 15$$

meets x-axis when $y = 0$

$$0 = -3x - 15$$

$$3x = -15$$

$$x = -5$$

$$\therefore D(-5, 0)$$

Line CD gradient = $\frac{5 - 0}{0 - (-5)} = 1$

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

$$y - 5 = 1(x - 0)$$

$$y = x + 5$$

$$x - y + 5 = 0$$

Both methods for finding line between two given points have been demonstrated in Q12 and Q14

COORDINATE GEOMETRYEXERCISE 5D

16)

$$y = -2x + 1 \quad (1)$$

$$y = x + 7 \quad (2)$$

(2) - (1)

$$0 = 3x + 6$$

$$-6 = 3x$$

$$-2 = x$$

Sub for x in (2)

$$y = -2 + 7 = 5$$

$$\therefore \underline{L(-2, 5)}$$

Given $M(-3, 1)$

Find line LM

$$\text{gradient} = \frac{5-1}{-2--3}$$

$$= \frac{4}{1} = 4$$

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

$$y - 5 = 4(x - -2)$$

$$y - 5 = 4(x + 2)$$

$$y - 5 = 4x + 8$$

$$y = 4x + 13$$

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