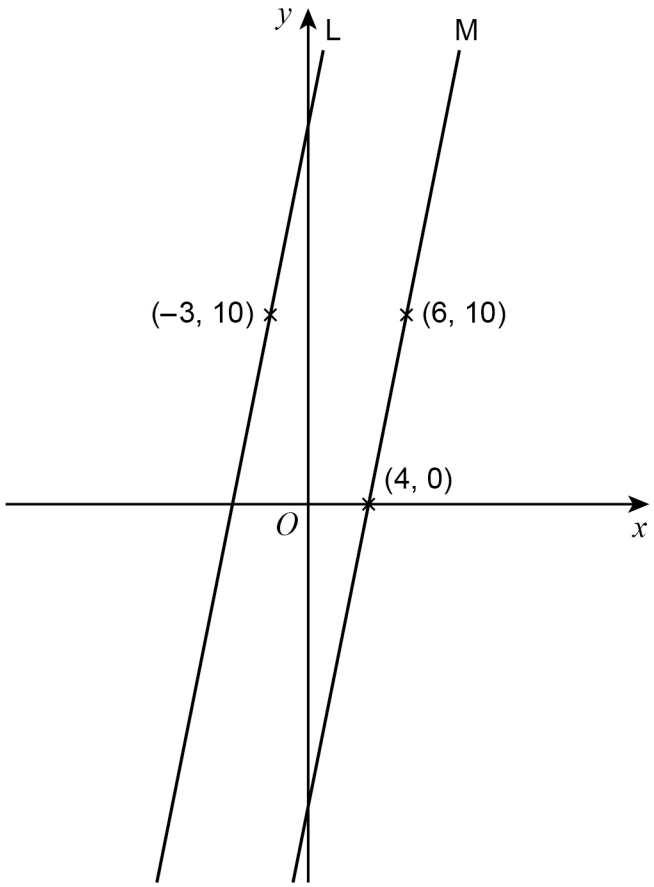
1 (–3, 10) is a point on line L.

(4, 0) and (6, 10) are points on line M.

L and M are parallel.



Not drawn accurately

Work out the equation of line L.

Give your answer in the form $y = mx + c$

[3 marks]

gradient of M : $\frac{10-0}{6-4} = \frac{10}{2} = 5$ (1)

gradient of L = M = 5

equation of L : $10 = 5(-3) + c$ (1)

$c = 25$

$\therefore y = 5x + 25$ (1)

Answer $y = 5x + 25$

2 The equation of a straight line is $2y = 3x + 5$

Circle the gradient of the line.

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

[1 mark]

$\frac{2}{3}$ $\frac{3}{2}$ 3 5

1

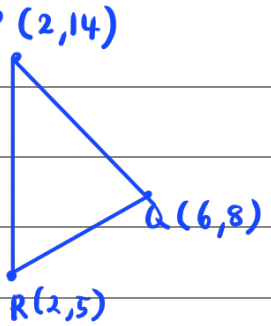
3 *P* is the point (2, 14)

Q is the point (6, 8)

R is the point (2, 5)

Use gradients to show that angle *PQR* is **not** a right angle.

[3 marks]



gradient $PQ = \frac{14-8}{2-6} = \frac{6}{-4} = -\frac{3}{2}$ (1)

gradient $QR = \frac{8-5}{6-2} = \frac{3}{4}$ (1)

No. since $-\frac{3}{2} \times \frac{3}{4} \neq -1$. (1)

4 A straight line → line 1

is perpendicular to the straight line through (2, 8) and (6, 15) → line 2

and

passes through (0, 9) and (x, 17)

Work out the value of x.

[4 marks]

gradient of line 2 : $\frac{15-8}{6-2} = \frac{7}{4}$ (1)

gradient of line 1 : $(-1)\frac{1}{\frac{7}{4}} = -\frac{4}{7}$ (1)

$\frac{17-9}{x} = -\frac{4}{7}$

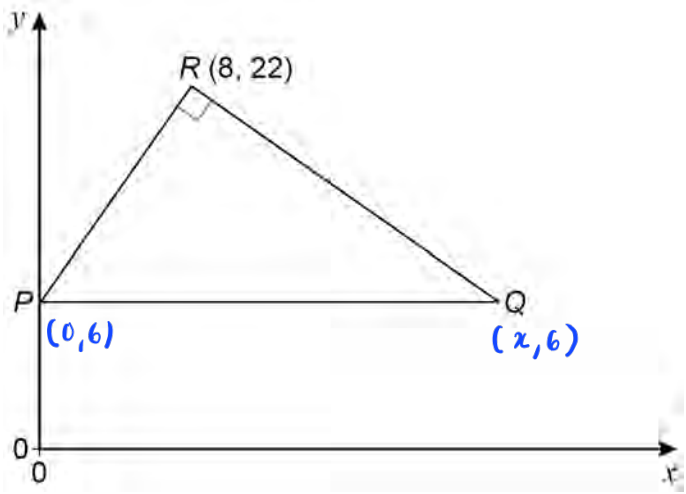
$8(7) = -4x$

$56 = -4x$ (1)

$x = -14$ (1)

$x =$ −14

5 Points P, Q and R (8, 22) form a triangle.



Not drawn accurately

PQ is a horizontal line, with P on the y-axis.

Angle PRQ is a right angle.

The gradient of PR is 2

Work out the coordinates of Q.

[5 marks]

$m_{PR} : 2 = \frac{22-y}{8-0}$

$2(8) = 22-y$

$y = 22-16$

$= 6$ (1)

$m_{PR} \times m_{RQ} = -1$

$m_{RQ} = \frac{-1}{2}$ (1)

$-\frac{1}{2} = \frac{6-22}{x-8}$ (1)

$-x+8 = 12-44$

$-x = -40$ (1)

$x = 40$

(1)

Answer (40 , 6)

6 Line A

has equation $y = ax - 1$

passes through the point (7, 13)

Line B has equation $5y - 3x = 4$

Show that line A has a greater gradient than line B.

[3 marks]

Line A: $13 = a(7) - 1$ (1)

$14 = 7a$

$a = 2$ (gradient) (1)

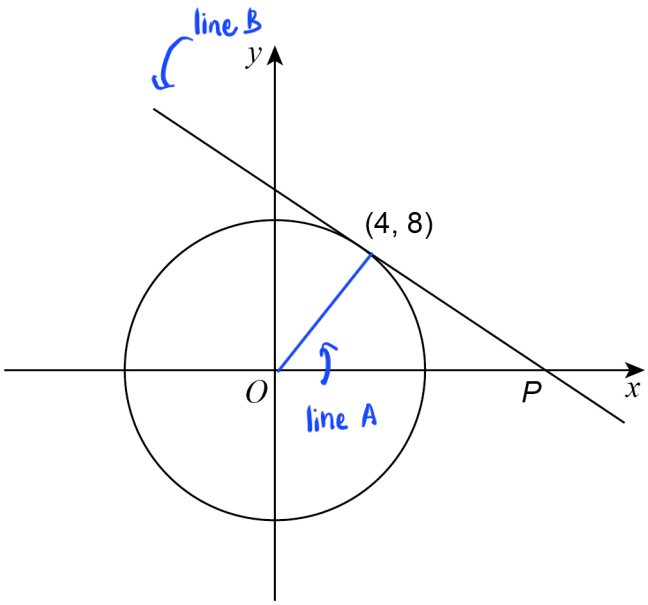
Line B: $5y = 4 + 3x$

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

gradient $= \frac{3}{5}$ (1)

7 (4, 8) is a point on a circle, centre O.

The tangent at (4, 8) intersects the x-axis at P.



Not drawn accurately

Work out the x-coordinate of P.

[5 marks]

gradient of line A $= \frac{8-0}{4-0} = 2$ (1)

gradient of line B $= \frac{-1}{2}$ (1)

$-\frac{1}{2} = \frac{0-8}{p-4}$ (1)

$-p+4 = -16$ (1)

$-p = -20$

$p = 20$ (1)

Answer 20

8 *P* and *Q* are points.

The x-coordinate of *Q* is 4 **more** than the x-coordinate of *P*.

The y-coordinate of *Q* is 5 **less** than the y-coordinate of *P*.

Work out the gradient of the straight line through *P* and *Q*.

[2 marks]

let P(0,0) , then Q(4,-5)

gradient : $\frac{-5-0}{4-0} = -\frac{5}{4}$

Answer $-\frac{5}{4}$ (2)

9 (a) Work out the equation of the line perpendicular to AC that passes through C.

[4 marks]

$m_{AC} = \frac{9-(-7)}{-5-3} = \frac{16}{-8} = -2$ ✓ (1)

gradient perpendicular to AC $= -\frac{1}{(-2)}$

$= \frac{1}{2}$ ✓ (1)

At $C(3, -7)$: $-7 = \frac{1}{2}(3) + c$

$-7 = 1.5 + c$

$c = -8.5$ ✓ (1)

$y = \frac{1}{2}x - 8.5$

Answer $y = \frac{1}{2}x - 8.5$ ✓ (1)