

# Coordinate Geometry

1. (a)  $p \in \mathbb{R}$  is a constant.

The point  $(p, 5)$  lies on the line

$$3x - 2y + 28 = 0.$$

Find the value of  $p$ .

$$p = \underline{\hspace{2cm}}$$

- (b) The line  $l$  has equation

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

The line  $h$  has equation

$$2x - 5y + 10 = 0.$$

Work out the size of the acute angle between the lines  $l$  and  $h$ . Give your answer correct to the nearest degree.

- (c) A line cuts the  $x$ -axis at the point  $A(a, 0)$  and the  $y$ -axis at  $B(0, b)$ , where  $a, b \in \mathbb{Z}$ .

The slope of this line is  $-\frac{2}{3}$ .

The area of the triangle enclosed by this line, the  $x$ -axis and the  $y$ -axis is 12 square units.

There are two different lines that satisfy these conditions. Find the equation of each of these lines.

It may be useful to draw a diagram.

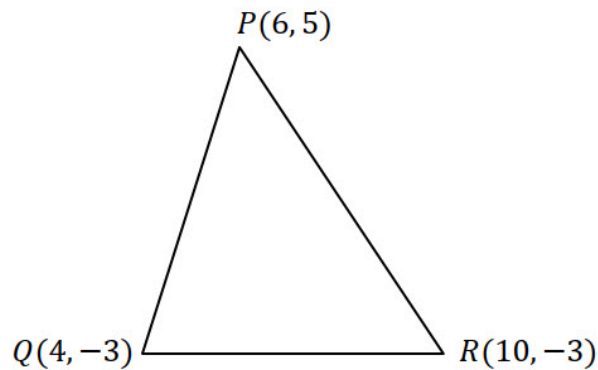
Line 1:  $\underline{\hspace{2cm}}$

Line 2:  $\underline{\hspace{2cm}}$

2. (a) The vertices of the triangle  $PQR$  are

$$P(6, 5), Q(4, -3), R(10, -3).$$

A diagram of the triangle is shown below.



- i. Write down the midpoint of the line segment  $[PQ]$ . ( , )
  - ii. Hence, or otherwise, find the equation of the perpendicular bisector of  $[PQ]$ .
  - iii. Hence, find the co-ordinates of the *circumcentre* of the triangle  $PQR$ , the point where the perpendicular bisectors of the sides meet.
- (b) The line  $AB$  intersects the  $x$ -axis at  $A$  and the  $y$ -axis at  $B$ . The point  $(-6, 2)$  is the midpoint of the line segment  $[AB]$ .
- i. Find the co-ordinates of  $A$ .  $A = ( , )$
  - ii. Find the co-ordinates of  $B$ .  $B = ( , )$