# 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 $p$.

$p =$ _____

(b) The line $l$ has equation
$$y = -\tfrac{1}{3}x + 11.$$
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 $-\dfrac{2}{3}$.
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.

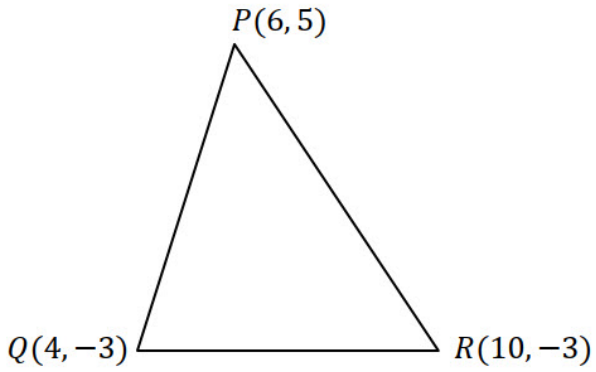
Line 1: _____

Line 2: _____

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 $B$. $B = ( , )$