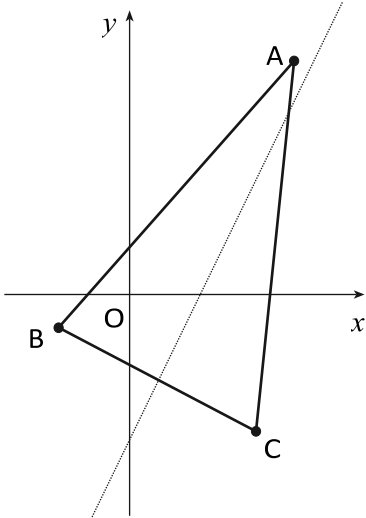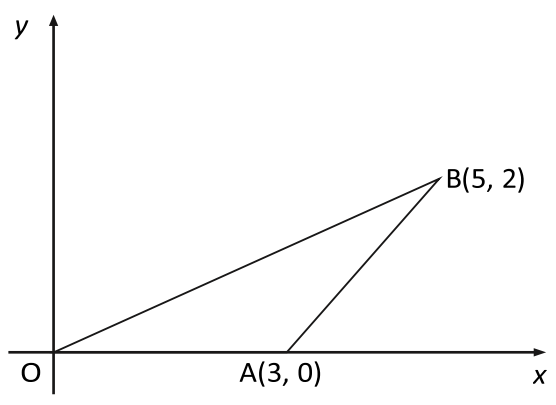|	Straight lines	
1.	A straight line passes through the point (1,3) and makes an angle of 60° with the positive direction of the *x*-axis. Find the equation of this straight line	2
2.	Find the equation of the perpendicular bisector to line AB if A is (-1,7) and B is (3, 9)	3
3.	Find the equation of the straight line parallel to $y + 2x + 9 = 0$ which passes through the point (-1, 3)	2
4.	The vertices of a triangle are P(-1,1), Q(2,1) and R(-2,2). Find the equation of the altitude of triangle PQR drawn from P	3

5.

The vertices of triangle ABC are A(7,9), B(-3, -1) and C(5,-5)

(a) Show that the equation of the perpendicular bisector of BC is $y = 2x – 5$ 4

(b) Find the equation of the median from C   3

(c) Find the coordinates of the point of intersection of the perpendicular bisector of BC and the median from C   3

A(3,0), B(5,2) and the origin are the vertices of this triangle

(a) Find the equation of the perpendicular bisector of AB   4

(b) The median from A has equation $y + 2x = 6$. Find T the point of intersection of this median and the perpendicular bisector of AB   2

(c) Calculate the angle that AT makes with the positive direction of the *x*-axis   2

	Straight lines - Answers	
1	The gradient of the line is tan60° = √3, Equation of the straight line is $y - 3 = √3(x - 1)$	
2	Midpoint of AB is (1,8), gradient of AB is ½, Gradient of perpendicular bisector is $m = -2$ The equation of the straight line is therefore $y - 8 = -2(x - 1)$	
3	$y + 2x + 9 = 0$ becomes $y = -2x - 9$, Gradient of the parallel line is $m = -2$ The equation of the straight line is therefore $y - 3 = -2(x + 1)$	
4	The altitude from P is perpendicular to line QR and passes through point (-1,1) The gradient of QR is $m = -1/4$, gradient of the altitude is bisector is $m = 4$ The equation of the straight line is therefore $y - 1 = 4(x + 1)$ or $y = 4x + 5$	
5 (a) (b) (c)	The midpoint of BC is (1, -3) The gradient of BC is $m = -1/2$, therefore the gradient of the bisector is $m = 2$ The equation of the perpendicular bisector is $y + 3 = 2(x - 1)$ or $y = 2x - 5$ as required The midpoint of AB is (2, 4) The gradient of the median from C is $m = -3$ The equation of the median is $y - 4 = -3(x - 2)$ or $y = -3x + 10$ Using simultaneous equations for $y = 2x - 5$ and $y = -3x + 10$ $2x - 5 = -3x + 10 \rightarrow 5x = 15 \rightarrow x = 3, y = 1$	
 (a) (b) (c)	The midpoint of AB is (4,1) The gradient of AB is $m = 1$, therefore the gradient of the bisector is $m = -1$ The equation of the perpendicular bisector is $y - 1 = -1(x - 4)$ or $y = -x + 5$ Using simultaneous equations for $y = -x + 5$ and $y + 2x = 6$ $-x + 5 + 2x = 6 \rightarrow x = 1$ $y = 4$ Gradient of AT is $m = -2$, using $m = \tan\theta$, $-2 = \tan\theta$, $\rightarrow \theta = 116.6°$	