

2.1 Equation of a Straight Line

Question Paper

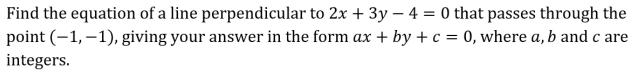
Course	Edexcel IAL Maths: Pure 1
Section	2. Coordinate Geometry
Topic	2.1 Equation of a Straight Line
Difficulty	V. Hard

Time allowed: 60

Score: /54

Percentage: /100

Question 1



[3 marks]

Question 2

The line l passes through the points (p, 2p) and (3p, 9p).

(a) Find an equation for the line l.

[3 marks]

Question 2

l intercepts the y-axis at (0,3).

(b) Find the value of p.

[2 marks]

Question 3

A line segment AB is the tangent to a circle at point M. The end points of AB have coordinates (-5, 16) and (5, 14) respectively and M is the midpoint of AB. The line MN is the diameter of the circle and N has coordinates (-4, -5). Find the coordinates of the centre of the circle C and the area of the circle to three significant figures.

[4 marks]

Question 4

Three points A, B and C, have coordinates (-4, -16), (2, 5) and (10, 33) respectively. Show that the lines AB and BC are collinear.

[4 marks]

Question 5

A dog breeder is measuring the rate at which a puppy grows by measuring its "back-length"— that is the distance from the base of the neck to the base of the tail. At 2 weeks old the puppy measured 5 cm. Six weeks later the puppy's back-length had increased by 4.2 cm.

(a)	Using a linear model, find an equation linking L , the length of the pupp	y in
	centimetres, to <i>w</i> , the age of the puppy in weeks.	

[3 marks]

Question 5

(b) What was the back-length of the puppy at birth?

[1 mark]

Question 5

(c) Use the model to find the age of a puppy that has a back-length of 23.9cm.

[1 mark]

Question 5

(d) This particular breed of dog is fully grown after 40 weeks.

Find the dog's length at 40 weeks and comment on the suitability of the model.

[2 marks]

Question 6

The line l_1 has equation 3x - 2y + 10 = 0 and crosses the *x*-axis at point *A*. The line l_2 is perpendicular to l_1 and crosses the *x*-axis at (9,0).

 l_2 crosses the y-axis at point B.

Find the area of the triangle OAB, where O is the origin.

[5 marks]

Question 7

The point P(-5, -2) lies on the line l_1 , l_1 crosses the x-axis at the point R. Another line, l_2 , is perpendicular to l_1 at the point P and crosses the x-axis at the point Q(-1,0).

Find the area of the triangle PQR.

[5 marks]

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A plumber charges a fixed fee of £27.50 plus £21 per hour. The plumber then charges VAT on top of the total cost at a rate of 20%.

(a) Defining suitable variables write down an equation to represent the charges, including VAT, made by the plumber.

[2 marks]

Question 8

A rival plumber charges a fixed fee of £37.80 plus £24 per hour. These prices already account for VAT.

(b) Find the number of hours for which both plumbers would charge the same amount.

[4 marks]

Question 9

A quadrilateral has four vertices with coordinates (-1,6), (-3,2), (0,-4) and (2,0). Find the equation for each of the four lines that form the quadrilateral and state its mathematical name.

[5 marks]

Question 10

Two perpendicular lines intersect at (-4, -4). One of the lines also passes through the point (0, 6), the other passes through the point (0, -5.6).

A kite is formed by these two lines and two others. The kite has a line of symmetry along the y-axis.

Find the area of the kite.

[4 marks]

Question 11

The tangent to a circle passes through the points A(-8,-1) and B(16,7). The tangent meets the circle at the point N, where AN:NB=5:3. Find the equation of the line of the diameter of the circle NM, giving your answer in the form ax+by+c=0, where a, b and c are integers to be found.

[6 marks]