

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

Find the equation of a line perpendicular to $2x + 3y - 4 = 0$ that passes through the point $(-1, -1)$, giving your answer in the form $ax + by + c = 0$, where a, b and c are integers.

[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 puppy in centimetres, to w , 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]

Question 8

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]