

## Topic 21 Quadratics 2 (Pre-TT) [45]

1.

Solve the equation  $x^2 + 4x - 10 = 0$

Give your answers to 2 decimal places.

You **must** show your working.

(Total 3 marks)

2.

$$x^2 - 8x + 10 = (x - a)^2 + b$$

(a) Find the values of  $a$  and  $b$ .

(3)

(b) Hence find the minimum value of  $x^2 - 8x + 10$

(1)

(Total 4 marks)

3.

Solve the simultaneous equations

$$x^2 + y^2 = 16$$

$$y = 3x - 1$$

Give your answers to an accuracy of 2 decimal places.

(Total 7 marks)

4.

A circle has equation  $x^2 + y^2 = 5$ .

(a) Write down the coordinates of the centre of the circle.

(b) Write down the exact length of the radius of the circle.

P is the point (1, 2) on the circumference of the circle  $x^2 + y^2 = 5$ .

(c) Work out the equation of the tangent to the circle at P.

(Total 6 marks)

5.

Solve the simultaneous equations

$$y = 3x^2 \quad 5x + y = 2$$

(Total 5 marks)

6.

The perimeter of a rectangle is 25 cm.

The length of the rectangle is  $x$  cm.



$x$  cm

Not to scale

(a) Write down an expression for the width of the rectangle in terms of  $x$ .

(1)

(b) The area of the rectangle is  $38 \text{ cm}^2$ .

Show that  $2x^2 - 25x + 76 = 0$

(2)

(c) Solve the equation given in part (b) to find the value of  $x$ .  
Give your answer to 2 decimal places.

(3)

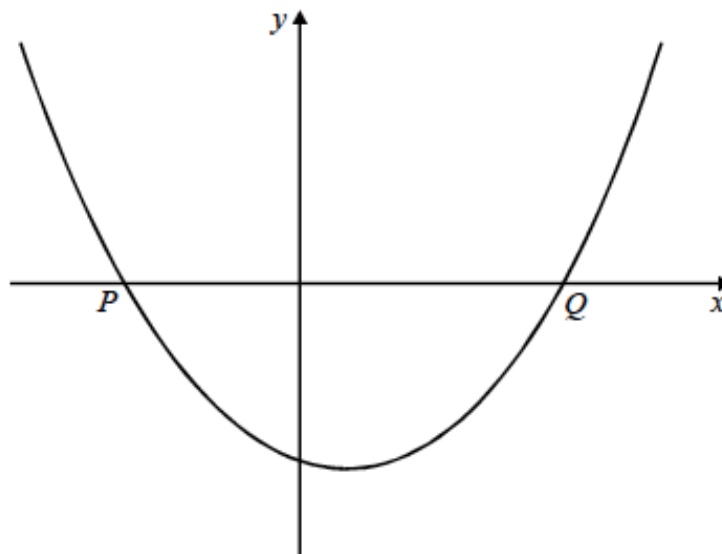
(Total 6 marks)

7.

(a) Factorise  $2x^2 - 7x - 15$

(2)

(b) The graph of  $y = 2x^2 - 7x - 15$  is sketched below.



Not to scale

Find the equation of the line of symmetry of this graph.

(3)

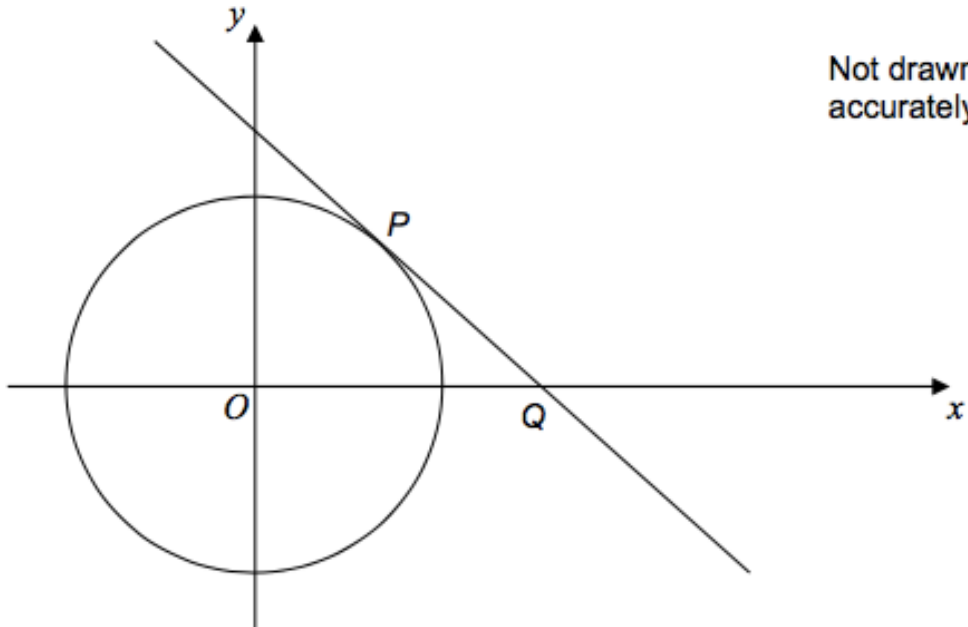
(Total 5 marks)

8.

The diagram shows the circle  $x^2 + y^2 = 10$

$P$  lies on the circle and has  $x$ -coordinate 1

The tangent at  $P$  intersects the  $x$ -axis at  $Q$ .



Work out the coordinates of  $Q$ .

**[5 marks]**

9.

(a) Write  $2x^2 + 16x + 35$  in the form  $a(x + b)^2 + c$  where  $a$ ,  $b$ , and  $c$  are integers.

(b) Hence, or otherwise, write down the coordinates of the turning point of the graph of  $y = 2x^2 + 16x + 35$

(Total 4 marks)