

Topic 21 Quadratics 2 (Post-TT) [47]

1.

Solve the equation

$$x^2 - 2x - 5 = 0$$

giving your answers to 3 significant figures.

(Total 3 marks)

2.

A circle of radius 5 has its centre at the origin.

Find the equation of the tangent to the circle at (3, 4)

(Total 4 marks)

3.

Find the values of a and b such that

$$x^2 - 10x + 18 = (x - a)^2 + b$$

(Total 2 marks)

4.

The base of a triangle is 7 cm longer than its height.

The area of the triangle is 32 cm^2 .

(a) Taking the height to be h cm, show that

$$h^2 + 7h - 64 = 0$$

(3)

(b) Solve this equation to find the height of the triangle.
Give your answer to 2 decimal places.

(3)

(Total 6 marks)

5.

Solve the simultaneous equations.

$$y = x + 7$$

$$x^2 + y^2 = 25$$

YOU **must** show your working. Do **not** use trial and improvement.

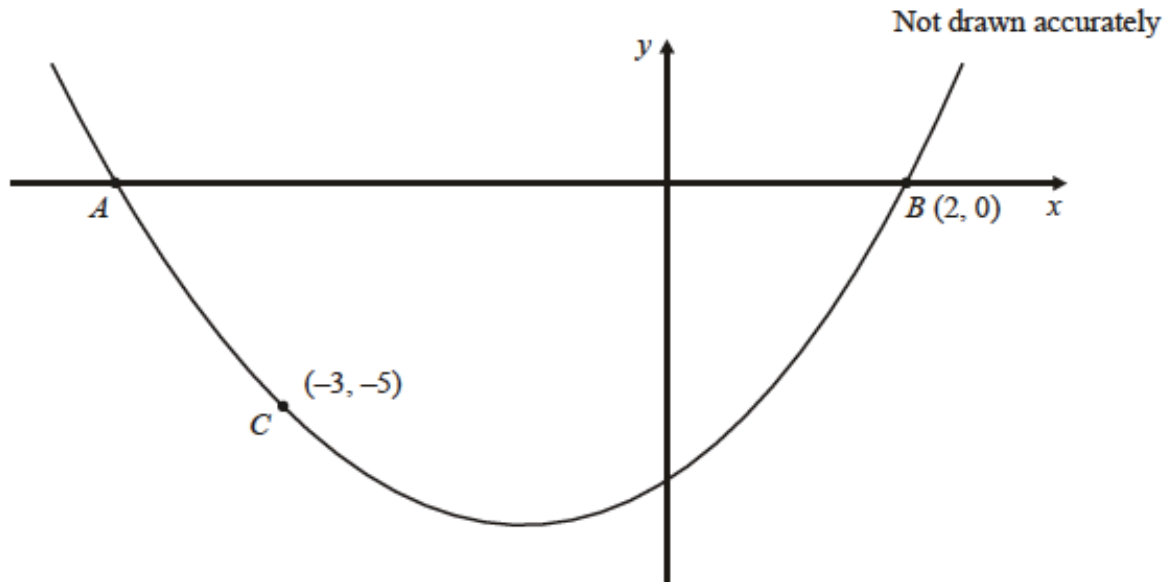
(Total 7 marks)

6.

The diagram shows the graph of the equation $y = x^2 + px + q$

The graph crosses the x -axis at A and $B(2,0)$.

$C(-3, -5)$ also lies on the graph.



(a) Find the values of p and q .

(4)

(b) Hence work out the coordinates of A .

(2)

(Total 6 marks)

7.

$2x^2 - 6x + 5$ can be written in the form $a(x - b)^2 + c$
where a , b and c are positive numbers.

(a) Work out the values of a , b and c .

[3 marks]

(b) Using your answer to part (a), or otherwise, solve $2x^2 - 6x + 5 = 8.5$

[3 marks]

8.

The line L is a tangent to the circle $x^2 + y^2 = 40$ At the point $A(2, 6)$.

The line L crosses the x -axis at the point P .

Work out the area of the triangle OAP .

(Total 6 marks)

9.

A straight line has the equation $y = 2x - 3$

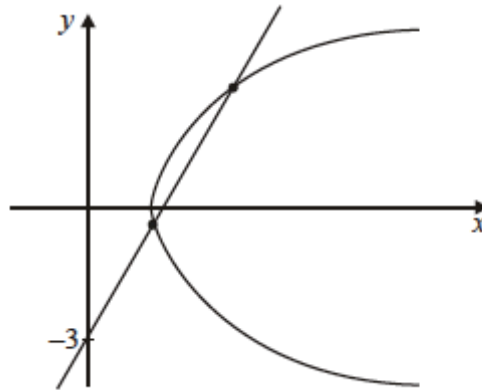
A curve has the equation $y^2 = 8x - 16$

- (a) Solve these simultaneous equations to find any points of intersection of the line and the curve.
Do not use trial and improvement.
You must show all your working.

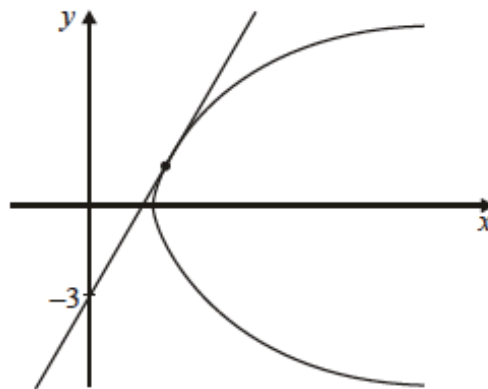
(5)

- (b) Here are three sketches showing the curve $y^2 = 8x - 16$ and three possible positions of the line $y = 2x - 3$

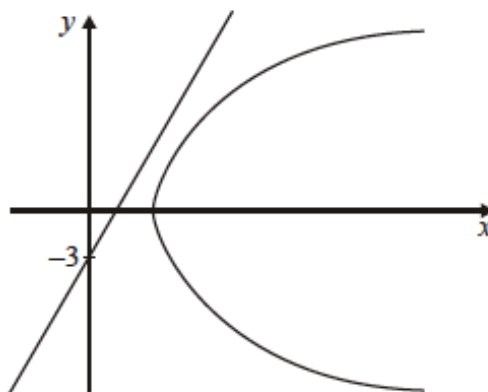
Sketch 1



Sketch 2



Sketch 3



Which is the correct sketch?

You must explain your answer.

(2)
(Total 7 marks)