

ASSIGNMENT TEST 7

26 MARKS

30 MINUTES

1. The curve C has equations $x = 3t^2$, $y = 6t$.

a Sketch the graph of the curve C . (3)

The curve C intersects the line with equation $y = x - 72$ at the points A and B .

b Find the length AB , giving your answer as a surd in its simplest form. (4)

2 The points $P(1, a)$, where $a > 0$, and $Q(b, 6)$ lie on the parabola C with equation $y^2 = 4x$. The perpendicular bisector of PQ meets the parabola at the points M and N . Show that the x -coordinates of M and N can be written in the form $x = \lambda \pm \mu\sqrt{29}$, where λ and μ are rational numbers to be found. (6)

3 A parabola C has equation $y^2 = 16x$. The point S is the focus of the parabola.

a Write down the coordinates of S . (1)

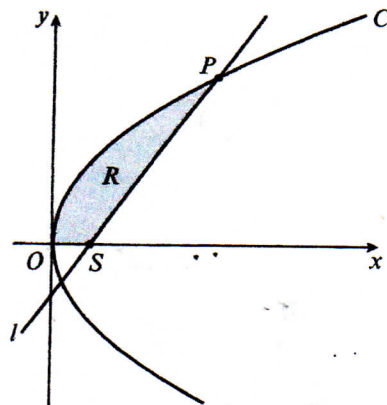
The point P with coordinates $(16, 16)$ lies on C .

b Find an equation of the line SP , giving your answer in the form $ax + by + c = 0$, where a , b and c are integers. (2)

The line SP intersects C at the point Q , where P and Q are distinct points.

c Find the coordinates of Q . (4)

4 The diagram shows the parabola C with equation $y^2 = 20x$. The straight line l with gradient $\frac{4}{3}$ passes through the focus, S , of the parabola and intersects C at the point P with positive y -coordinate.



Find the area of the shaded region R bounded by C , l and the x -axis. (6)