

Activity 1

Work through the question first. Then use the mark scheme to help you keep a record of where you have awarded the AO marks (and which they are)

2. **In this question you must show all steps of your working.**
Solutions relying on calculator technology are not acceptable.

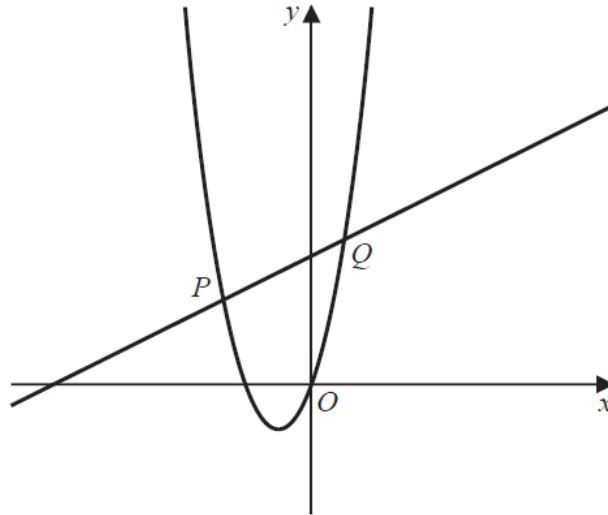


Figure 1

Figure 1 shows a sketch of the curve with equation $y = 2x^2 + 3x$ and the straight line with equation $y = \frac{1}{2}x + 3$

The line meets the curve at the points P and Q , as shown in Figure 1.

- (a) Using algebra, find the coordinates of P and the coordinates of Q .

(5)

- (b) Hence write down the range of values of x for which $2x^2 + 3x \geq \frac{1}{2}x + 3$

(2)

Activity 1

Mark Scheme

Question Number	Scheme	Marks
2.(a)	$2x^2 + 3x = \frac{1}{2}x + 3 = 0 \Rightarrow 4x^2 + 5x - 6 = 0$ $(4x - 3)(x + 2) = 0 \Rightarrow x = \frac{3}{4}, -2$ $x = \frac{3}{4}, y = \frac{27}{8} \quad x = -2, y = 2$	M1 dM1 A1 ddM1 A1 (5)
(b)	Chooses outside (for x) $x_n - 2, x \dots \frac{3}{4}$	M1A1 (2) (7 marks)

M1 Sets equations equal to each other and attempts to put in quadratic form

dM1 Attempts to solve $3TQ = 0$

A1 $x = \frac{3}{4}, -2$

ddM1 Finds at least one y coordinate from their x coordinate

A1 Both correct pairs $x = \frac{3}{4}, y = \frac{27}{8} \quad x = -2, y = 2$

(b)

M1 Chooses the outside region for their x values

A1 $x_n - 2, x \dots \frac{3}{4}$

Activity 1

6.

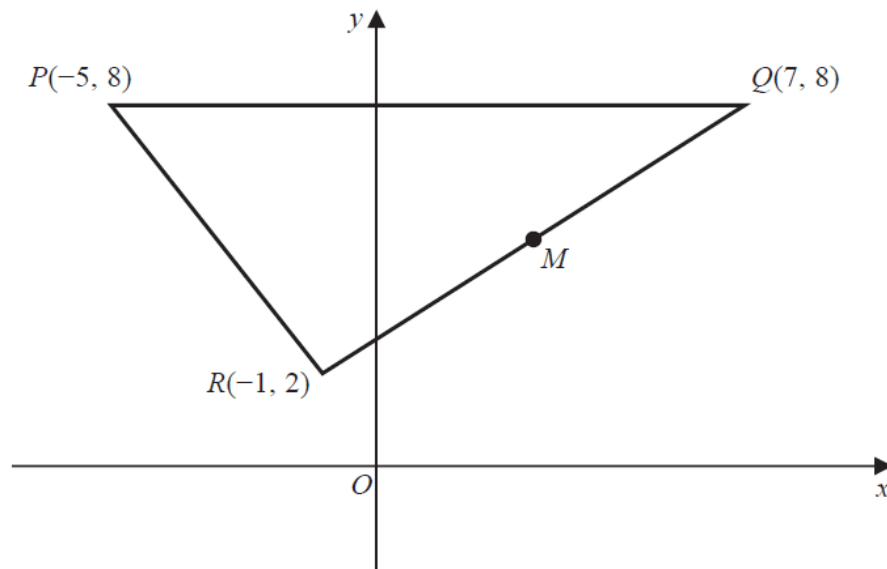


Figure 3

The points $P(-5, 8)$, $Q(7, 8)$ and $R(-1, 2)$ form the vertices of a triangle PQR , as shown in Figure 3. The point M is the midpoint of QR .

The line l passes through M and is parallel to PR .

- (a) Find an equation for l , writing your answer in the form $ax + by + c = 0$, where a , b and c are integers to be found.
- (4)**

The line l cuts PQ at the point N .

- (b) Find
- (i) the coordinates of N ,
 - (ii) the area of triangle MNQ .

(3)