

Question	Scheme	Marks	AOs
15(a)	$-\frac{2}{5}$	B1	1.1b
		(1)	
(b)	$-\frac{2}{5} \rightarrow \frac{5}{2}$	M1	1.1b
	$y-16 = \frac{5}{2}(x-10)$	M1	1.1b
	$5x-2y-18=0$	A1	2.2a
		(3)	
(c)	$5x-18=0 \Rightarrow x = \frac{18}{5}$	M1	1.1b
		A1	1.1b
		(2)	
(d)	Coordinates of R (50, 0)	B1	2.2a
	Area = $\frac{1}{2} \times 16 \times \left(50 - \frac{18}{5}\right) = \frac{1856}{5}$ (= 371.2) (units ²)	M1	3.1a
		A1	1.1b
		(3)	
(e)	Curve crosses positive x axis at x = 20 only	B1	2.2a
	$\int \left(-\frac{3}{50}x^2 + \frac{1}{5}x + 20\right) dx = -\frac{1}{50}x^3 + \frac{1}{10}x^2 + 20x (+c)$	M1A1	1.1b 1.1b
	$\left(-\frac{1}{50}(20)^3 + \frac{1}{10}20^2 + 20 \times 20\right) - \left(-\frac{1}{50} \times 10^3 + \frac{1}{10}10^2 + 20 \times 10\right)$ (= 90)	M1	1.1b
	$\frac{\frac{1}{2} \times 16 \times (50-10) - "90"}{371.2} = \frac{575}{928}$	dM1	3.1a
		A1	2.2a
		(6)	

(15 marks)

Notes

(a)

B1: $-\frac{2}{5}$ o.e.

(b)

M1: Finds the negative reciprocal of their gradient in (a)

M1: Attempts the equation of the line using their changed gradient from (a) and (10, 16), with both coordinates substituted in correctly e.g. $y-16 = \frac{5}{2}(x-10)$. If they use $y = mx + c$ they must proceed as far as $c = \dots$

A1: $5x-2y-18=0$ or any integer multiple

(c)

M1: Sets $y=0$ for their linear equation found in (b) and proceeds to find a value for x

A1: $x = \frac{18}{5}$ o.e.

(d)

B1: Deduces that the x coordinate of R is 50

M1: Attempts to find the area of triangle PQR using their x coordinate for R and their x coordinate for Q

A1: 371.2 o.e. (units²)

(e)

B1: Deduces that the curve crosses the positive x axis at 20 (may be via a calculator)

M1: Attempts to integrate the equation of the curve. Look for one index correct

A1: $-\frac{1}{50}x^3 + \frac{1}{10}x^2 + 20x$ with or without the constant of integration

M1: Attempts to substitute in the limits “20” and 10 and subtracts either way round

dM1: Attempts to find the fraction of triangle PQR shaded. It is dependent on the previous two method marks.

A1: $\frac{575}{928}$ cao