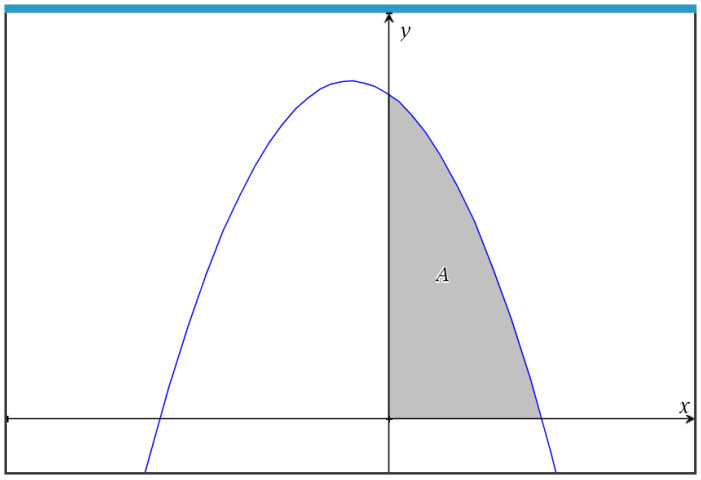
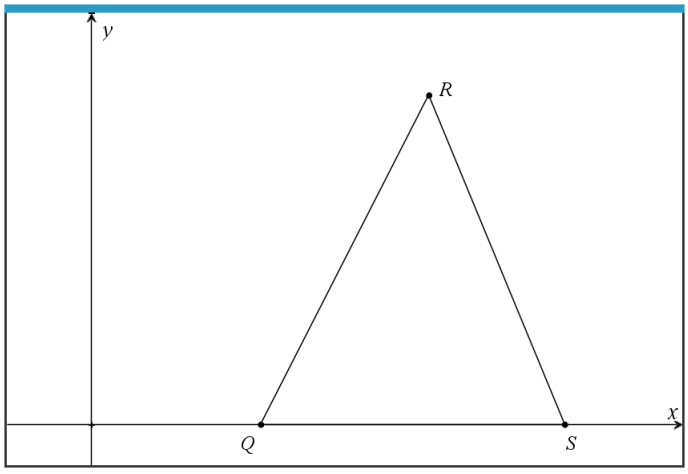
The following diagram gives some of the graph $g(x) = (4 - 2x)(3 + x)$. The shaded region *A* is bounded by the *x*-axis, *y*-axis, and the graph of *g*.



(a) Write down the integral for the area of region A. (2 marks)

(b) Find the area of region A. (1 mark)

The three points Q(2,0), R(4, 8), and S(c, 0) create the triangle below.



(This question continues on the following page)

(c) Find the value of c, the x-coordinate of *S*, such that the area of the triangle is equivalent to the area of region *A* in part (b). (2 marks)

Mark scheme:

(a) $A = \int_0^2 (4 - 2x)(3 + x)dx$ (A1)(A1)

Note: Award **A1** for having the correct limits x = 0 and x = 2. Award **A1** for an integral of *f(x)*.

(b) 14.7 (accept $14\frac{2}{3}$, 14.6666…) (A1)

(c) $14\frac{2}{3} = \frac{1}{2} \times (c - 2) \times (8)$ (M1)

$c = \frac{17}{3}$ (accept $5\frac{2}{3}, 5.67, 5.6666$ ...) (A1)