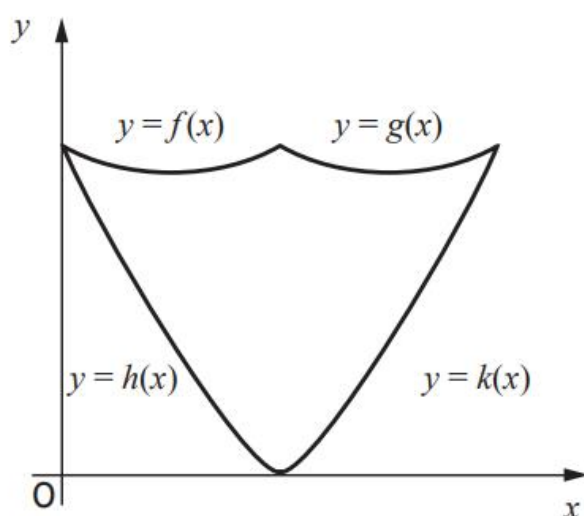


Higher Maths  
SQA 2015 Paper 2  
Question 4



A wall plaque is to be made to commemorate the 150th anniversary of the publication of “*Alice’s Adventures in Wonderland*”.

The edges of the wall plaque can be modelled by parts of the graphs of four quadratic functions as shown in the sketch.



- $f(x) = \frac{1}{4}x^2 - \frac{1}{2}x + 3$
- $g(x) = \frac{1}{4}x^2 - \frac{3}{2}x + 5$
- $h(x) = \frac{3}{8}x^2 - \frac{9}{4}x + 3$
- $k(x) = \frac{3}{8}x^2 - \frac{3}{4}x$

- (a) Find the  $x$ -coordinate of the point of intersection of the graphs with equations  $y = f(x)$  and  $y = g(x)$ . 2

The graphs of the functions  $f(x)$  and  $h(x)$  intersect on the  $y$ -axis.

The plaque has a vertical line of symmetry.

- (b) Calculate the area of the wall plaque. 7

Answers: (a)  $x = 2$

(b)  $\frac{19}{3}$