



The diagram shows the curve  $y = x(x - 1)(x - 2)$ , which crosses the  $x$ -axis at the points  $O(0, 0)$ ,  $A(1, 0)$  and  $B(2, 0)$ .

- (i) The tangents to the curve at the points  $A$  and  $B$  meet at the point  $C$ . Find the  $x$ -coordinate of  $C$ . [5]
- (ii) Show by integration that the area of the shaded region  $R_1$  is the same as the area of the shaded region  $R_2$ . [4]