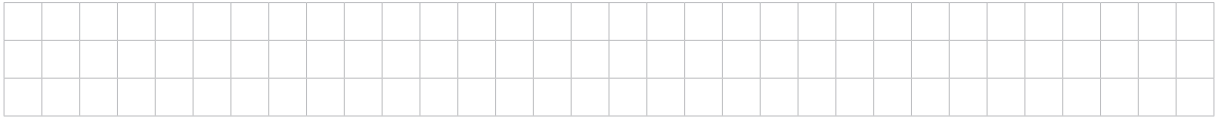


(i) On the axes in Figure 13, sketch the graph of $f^{-1}(x)$.

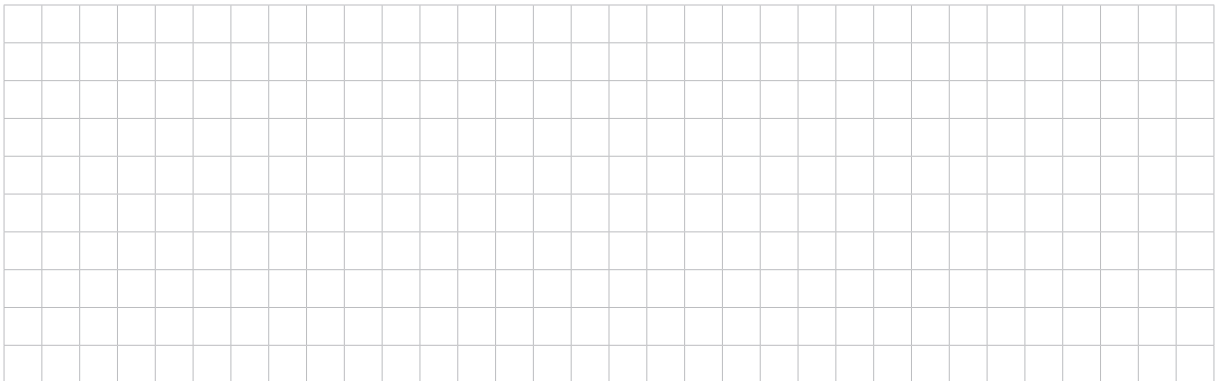
(2 marks)

(ii) Write the exact domain of $f^{-1}(x)$.



(1 mark)

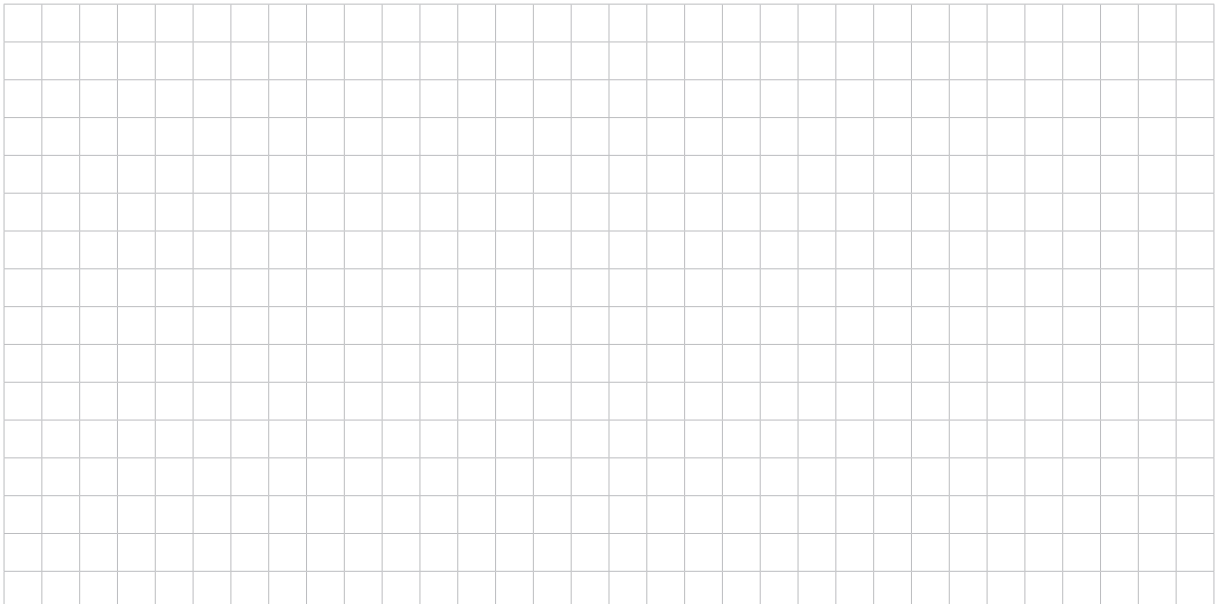
(iii) Find the equation of $f^{-1}(x)$.



(2 marks)

(c) If $y = \arcsin(x^2)$, then $x^2 = \sin y$.

Hence use implicit differentiation to show that $\frac{dy}{dx} = \frac{2x}{\sqrt{1-x^4}}$.



(3 marks)

(d) (i) Use integration by parts to show that

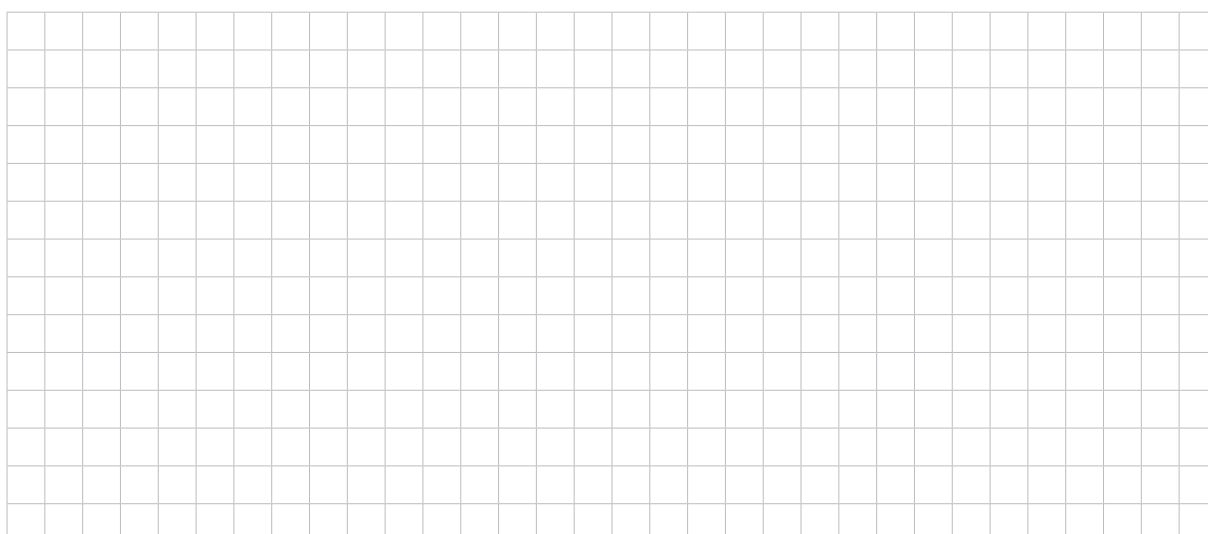
$$\int x \arcsin(x^2) dx = \frac{1}{2} x^2 \arcsin(x^2) + \frac{1}{2} \sqrt{1-x^4} + c$$

where c is a constant.



(3 marks)

(ii) Hence find the exact value of $\int_0^1 x \arcsin(x^2) dx$.



(2 marks)