Section 2: Inverse trigonometric functions

Exercise level 3

1. What is the maximum value of $(\arcsin x)(\arccos x)$?
   Find the answer
   (i) by differentiating
   (ii) by considering the value of $\arcsin x + \arccos x$

2. Evaluate
   (i) $\int_0^1 \left(\frac{9}{1+16x^2} + \frac{16}{9+x^2} + \frac{1}{16+9x^2} \right) \mathrm{d}x$
   (ii) $\int_0^{\frac{1}{4}} \left(\frac{9}{\sqrt{1-16x^2}} + \frac{16}{\sqrt{9-x^2}} + \frac{1}{\sqrt{16-9x^2}} \right) \mathrm{d}x$

3. Find the area enclosed by $y = \arcsin x$, $y = \arccos x$ and $y = \arctan x$.