

Section 2: Inverse trigonometric functions

Exercise level 2

1. Differentiate

(i) $\arctan(x^2)$

(ii) $\arcsin\left(\frac{1}{x}\right)$

(iii) $\arccos(1-\sqrt{x})$

(iv) $\arcsin(\arctan(x))$

2. (a) Evaluate $\int_c^d \frac{9}{1+4x^2} dx$

(i) for $c=0, d=\frac{1}{2}$

(ii) for $c=\frac{\sqrt{3}}{2}, d=\infty$

(b) Evaluate $\int_c^d \frac{9}{\sqrt{1-4x^2}} dx$

(i) for $c=0, d=\frac{1}{2}$

(ii) for $c=\frac{1}{2\sqrt{2}}, d=\frac{\sqrt{3}}{4}$

3. Use integration by parts to find:

(i) $\int \arcsin 2x dx$

(ii) $\int \arctan 3x dx$

(iii) $\int (\arcsin x + \arctan x) dx$

[Hint: write $f(x)$ as $1 \times f(x)$]