

1.

[5 points]

Let $f(x) = \frac{\arctan(x^2)}{\sin x}$. By writing:

$$\arctan(x^2) \equiv (\sin x)(a_0 + a_1x + a_2x^2 + a_3x^3 + \dots)$$

find the first two non-zero terms of the Maclaurin series for $f(x)$.

2.

[10 points]

(a) Find the first four non-zero terms of the Macluarin series for $\frac{1}{\sqrt{1+x}}$.

(b) Hence, or otherwise, find the first four non-zero terms of the Maclaurin series for $\frac{1}{\sqrt{1-x^2}}$.

(c) Hence, or otherwise, find the first three non-zero terms for the Maclaurin series for:

(i) $\frac{x}{\sqrt{(1-x^2)^3}}$

(ii) $\arcsin x$.

3.

[5 points]

Find the Maclaurin series up to x^4 term for e^{e^x-1} .