Assignment 2.

1. Expand $\dfrac{2 - x^2}{\sqrt{4 + 3x}}$ in ascending powers of x, up to and including the term in x^3, simplifying the coefficients. [6]

2. (a) Simplify the expression $(\sqrt{1+x} + \sqrt{1-x})(\sqrt{1+x} - \sqrt{1-x})$. [2]

   (b) Using this result, expand $\dfrac{1}{\sqrt{1+x} + \sqrt{1-x}}$ in ascending powers of x, up to and including the term in x^4. [5]

3. When $(2 - 3x)(1 + ax)^{\frac{3}{4}}$, where a is a constant, is expanded in ascending powers of x, the coefficient of the term in x is zero.

(a) Find the value of a. [3]

(b) When a has this value, find coefficient of the term in x^4 in the expansion of $(2 - 3x)(1 + ax)^{\frac{3}{4}}$. [4]

4. It is given that $f(x) = \dfrac{x^2}{(x + 1)(x - 1)^2}$.

(a) Write $f(x)$ in terms of partial fractions. [4]

(b) Hence expand $f(x)$ in ascending powers of x, up to and including the term in x^4. [4]

Total mark of this assignment: 28.