

Let $f(x) = \frac{-7x^2 + 2x - 6}{(1+x)(4+x^2)}$.

(a) Express $f(x)$ in partial fractions. [5]

(b) Hence find the exact value of $\int_0^2 f(x) dx$. Give your answer in the form $a\pi - \ln b$, where a and b are constants. [6]