

Let  $f(x) = \frac{5x^2 + x + 11}{(4 + x^2)(1 + x)}$ .

[5]

(a) Express  $f(x)$  in partial fractions.

(b) Hence show that  $\int_0^2 f(x) \, dx = \ln 54 - \frac{1}{8}\pi$ .

[5]