4. $$\mathrm{f}(x) = \frac{1-3x}{(1+3x^2)(1-x)^2}, \quad x \neq 1.$$

(*a*) Find the constants A, B, C and D such that

$$\mathrm{f}(x) \equiv \frac{Ax+B}{1+3x^2} + \frac{C}{1-x} + \frac{D}{(1-x)^2}.$$

(5)

(*b*) Find a series expansion for f(x) in ascending powers of x, up to and including the term in x^4.

(4)

(*c*) Find an equation of the tangent to the curve with equation $y = \mathrm{f}(x)$ at the point where $x = 0$.

(2)