2015 **12 c** Find $f'(x)$, where $f(x) = \dfrac{x^2+3}{x-1}$. **2**

Using the quotient rule,

Let $u = x^2 + 3$ $\quad u' = 2x$

Let $v = x - 1$ $\quad v' = 1$

$$\frac{dy}{dx} = \frac{vu' - uv'}{v^2}$$

$$= \frac{(x-1).2x - (x^2+3).1}{(x-1)^2}$$

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

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

State Mean: **1.67**

* These solutions have been provided by *projectmaths* and are not supplied or endorsed by BOSTES.

Board of Studies: Notes from the Marking Centre

(c) The majority of candidates used the quotient rule to successfully find the derivative. Those candidates who used the product rule often made careless algebraic errors.

Common problems were:

- using an incorrect formula, for example $\frac{uv' \pm vu'}{v^2}$
- not including brackets in the answer, for example $\frac{2x(x-1)-x^2+3}{(x-1)^2}$
- making algebraic errors when expanding and/or simplifying
- using incorrect derivatives for u and v.