

| Question | | Answer | Marks | AOs | | Guidance |
|----------|-----|--|--|--|---|--|
| 15 | (a) | $[h(x) \text{ or } fg(x) =] \sqrt{x^3 - x - 6} \text{ oe}$ $x > 2$ | B1 B1 [2] | 1.1 1.1 | expression domain | mark the final answer |
| 15 | (b) | $\sqrt{18} \text{ oe isw FT their } h(x)$ | B1 [1] | 1.1 | allow 4.2426406872... rounded to 2 or more sf | |
| 15 | (c) | $\frac{1}{2} \times \frac{3x^2-1}{\sqrt{(x^3-x-6)}} \text{ or } \frac{3x^2-1}{2h(x)} \text{ oe}$ <i>their</i> $\frac{dh}{dx}$ evaluated at $x = 3$ $\frac{3\sqrt{2}}{13}$ or 0.326356975932 rounded to 2 sf or better | M1 A1 M1 A1 [4] | 3.1a 1.1 1.1 3.2a | chain rule used all correct | allow one slip in differentiation, eg sign error $h(x)$ must be correct for first M1 |
| | | <i>OR</i> $x^2 = y^3 - y - 6 \Rightarrow 2x \frac{dx}{dy} = 3y^2 - 1 \text{ oe}$ $\frac{dx}{dy} = \frac{3y^2-1}{2x} \text{ or } \frac{dy}{dx} = \frac{2x}{3y^2-1}$ substitution of $y = 3$ and $x = \text{their } \sqrt{18}$ $\frac{3\sqrt{2}}{13}$ or 0.326356975932 rounded to 2 sf or better | M1 A1 M1 A1 [4] | | | allow one slip eg sign error rearrangement to find $h^{-1}(x)$ explicitly in terms of x followed by differentiation does not score |