10 The functions f and fg are defined by

$$\mathrm{f}(x) = \mathrm{e}^{x^2+3} \quad \text{for } x < 0$$

$$\mathrm{fg}(x) = \mathrm{e}^{2x} \quad \text{for } x > \frac{3}{2}.$$

(a) Explain why f^{-1} exists. [1]

(b) Find an expression for $\mathrm{f}^{-1}(x)$ and state the domain and range of f^{-1}. [5]

(c) Hence find and simplify an expression for $\mathrm{g}(x)$. [2]

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11 In the binomial expansion of $\left(2+\frac{x}{2}\right)^n$, the first three terms in increasing powers of x are $b+abx+\frac{9}{8}abx^2$. Find the values of the constants n, a and b. [8]

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