5 The functions f and g are defined as follows.

$$\mathrm{f}(x) = x^2 + 4x \quad \text{for} \quad x \in \mathbb{R}$$

$$\mathrm{g}(x) = 1 + \mathrm{e}^{2x} \quad \text{for} \quad x \in \mathbb{R}$$

(a) Find the range of f. [2]

(b) Write down the range of g. [1]

(c) Find the exact solution of the equation $\mathrm{fg}(x) = 21$, giving your answer as a single logarithm. [4]

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