8 An arithmetic progression has first term t and common difference 1.5.
The 4th, 8th and 20th terms of this arithmetic progression form the 1st, 2nd and 3rd terms of a geometric progression.

(a) Find the value of t. [5]

(b) Find the common ratio of the geometric progression. [2]

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9 It is given that $\mathrm{f}(x) = \ln(2x+5)$ for $x > a$, where a is a constant.

(a) Write down the least possible value of a. [1]

(b) Using your value of a, write down the range of f. [1]

It is also given that $\mathrm{g}(x) = x^2 + 1$ for $x \in \mathbb{R}$.

(c) Using your value of a, solve the equation $\mathrm{fg}(x) = 4$.
Give your answers in exact form. [3]