5 **(a)** In an arithmetic progression:

- the first term is 3
- the sum of the first 10 terms is 4 times the sum of the first 5 terms.

Find the common difference. [3]

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(b) The 1st, 2nd and 5th terms of another arithmetic progression are the 1st, 2nd and 3rd terms of a geometric progression.

It is given that the 1st terms of the progressions are **not** 0.
Find the common ratio, r, where $r \neq 1$, of the geometric progression. [4]

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6 Solve the equation $\left|x^2 - 5x\right| = 6$. [5]

7 **(a)** Differentiate $\dfrac{\sin x + \cos x}{e^{1-3x}}$ with respect to x. [4]

(b) Find $\int \left(1 + \tan^2 3x\right) dx$. [3]

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