3 DO NOT USE A CALCULATOR IN THIS QUESTION.

(a) Show that $x+3$ is a factor of $-12+23x+3x^2-2x^3$. [1]

(b) The curve $y=-5+33x+3x^2-2x^3$ and the line $y=10x+7$ intersect at three points, A, B and C. These points are such that the x-coordinate of A has the least value and the x-coordinate of C has the greatest value. Show that B is the mid-point of AC. [7]

4 Variables x and y are related by the equation $y = 2 + \tan(1 - x)$ where $0 \leqslant x \leqslant \frac{\pi}{2}$. Given that x is increasing at a constant rate of 0.04 radians per second, find the corresponding rate of change of y when $y = 3$. [6]

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