11 It is given that $\int_1^a \left(\frac{3}{3x+2} - \frac{2}{2x+1} - \frac{1}{x}\right) \mathrm{d}x = \ln\frac{1}{5}$, where $a > 1$. Find the exact value of a. [6]

12 It is given that $y = \dfrac{\left(3x^2 - 2\right)^{\frac{2}{3}}}{x - 1}$, for $x > 1$.

(a) Write $\dfrac{\mathrm{d}y}{\mathrm{d}x}$ in the form $\dfrac{\left(3x^2 - 2\right)^{-\frac{1}{3}}}{\left(x - 1\right)^2}\left(x^2 + Ax + B\right)$, where A and B are integers. [5]

(b) Find the approximate increase in y as x increases from 2 to $2 + p$, where p is small. [2]

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