Advanced Higher Maths
SQA 2016 Specimen
Question 8

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Maths.scot

(a) Find the Maclaurin expansions up to and including the term in x^3, simplifying the coefficients as far as possible, for the following: **5**

(i) $f(x) = e^{3x}$

(ii) $g(x) = (x+2)^{-2}$

(b) Given that $h(x) = \dfrac{x\,e^{3x}}{(x+2)^2}$ use the expansions from (a) to approximate the value of $h\left(\dfrac{1}{2}\right)$. **3**

Answers:

(a) (i) $1 + 3x + \frac{9}{2}x^2 + \frac{9}{2}x^3 + \ldots$

(ii) $\frac{1}{4} - \frac{1}{4}x + \frac{3}{16}x^2 - \frac{1}{8}x^3 + \ldots$

(b) $0 \cdot 327$