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5. $y = \sqrt{4 + \ln x} \qquad x > \frac{1}{2}$

(a) Show that

$$\frac{d^2y}{dx^2} = -\frac{9 + 2\ln x}{4x^2(4 + \ln x)^{\frac{3}{2}}}$$

(5)

(b) Hence, or otherwise, determine the Taylor series expansion about $x = 1$ for y, in ascending powers of $(x - 1)$, up to and including the term in $(x - 1)^2$, giving each coefficient in simplest form.

(3)

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