**1** Solve the following simultaneous equations.

$$\frac{y}{x} = \frac{3}{2}$$

$$\frac{y^4}{x^5} = \frac{27}{16}$$ [3]

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**2** Variables $x$ and $y$ are related by the equation $y = x\sqrt{1+2x}$.

**(a)** Find $\frac{\mathrm{d}y}{\mathrm{d}x}$. [3]

**(b)** It is given that when $y = 12$, $x = 4$. Find the approximate change in $x$ when $y$ increases from 12 by the small amount 0.06. [3]

**(c)** Find the $x$-coordinate of the stationary point on the curve $y = x\sqrt{1+2x}$. [2]

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