3 Functions f and g are such that

$$\mathrm{f}(x) = \frac{3x}{x+4} \quad \text{for } x > 0$$

$$\mathrm{g}(x) = \sqrt{x+2} \quad \text{for } x > -2\,.$$

Solve the equation $\mathrm{fg}(x) = 1$. [4]

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4 **(a)** Given that $y = 4\sin 2x \cos 2x$, find the value of $\frac{dy}{dx}$ when $x = \frac{\pi}{6}$. [4]

(b) A curve has equation $y = 4\sin 2x \cos 2x$.

The normal to the curve at the point where $x = \frac{\pi}{6}$ meets the x-axis at the point P.

Find the exact coordinates of P. [5]