

13. Functions f and g are defined by:

- $f(x) = 2 \sin x$, where $0 < x < \frac{\pi}{2}$
- $g(x) = 2x$, where $0 < x < \frac{\pi}{4}$

- (a) (i) Evaluate $f\left(g\left(\frac{\pi}{6}\right)\right)$. 1
- (ii) Determine an expression for $f(g(x))$. 2
- (b) (i) Given that $f(p) = \frac{1}{3}$, determine the exact value of $\sin p$. 1
- (ii) Hence, determine the exact value of $f(g(p))$. 3