

11 The function f is defined by $f : x \mapsto 4 \sin x - 1$ for $-\frac{1}{2}\pi \leq x \leq \frac{1}{2}\pi$.

(i) State the range of f . [2]

(ii) Find the coordinates of the points at which the curve $y = f(x)$ intersects the coordinate axes. [3]

(iii) Sketch the graph of $y = f(x)$. [2]

(iv) Obtain an expression for $f^{-1}(x)$, stating both the domain and range of f^{-1} . [4]