6 The function $f : x \mapsto 5\sin^2 x + 3\cos^2 x$ is defined for the domain $0 \leqslant x \leqslant \pi$.

 (i) Express $f(x)$ in the form $a + b\sin^2 x$, stating the values of a and b. [2]

 (ii) Hence find the values of x for which $f(x) = 7\sin x$. [3]

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