(a) Express $(\sin x-\cos x)^{2}$ in the form $p+q \sin r x$ where $p, q$ and $r$ are integers.
(b) Hence, find $\int(\sin x-\cos x)^{2} d x$.

Answers:
(a) $1-\sin 2 x$
(b) $x+\frac{1}{2} \cos 2 x+c$

