

Section 3: Further integration

Exercise level 1

1. Find the following integrals.

(i) $\int \frac{1}{\sqrt{2x-x^2}} dx$

(ii) $\int \frac{1}{x^2+4x+5} dx$

2. (i) Write $\frac{8}{(x+2)(x^2+4)}$ in partial fractions.

(ii) Hence evaluate $\int_0^2 \frac{8}{(x+2)(x^2+4)} dx$.

3. (i) Use the substitution $x = \frac{1}{2} \sin u$ to find $\int \sqrt{1-4x^2} dx$

(ii) Use the substitution $x = 2 \tan \theta$ to evaluate $\int_0^2 \frac{1}{(4+x^2)^{\frac{3}{2}}} dx$