

Practice for assessment: Methods in Algebra and Calculus
Methods in Algebra and Calculus Standard 1.3

1. Find:

a. $\int \frac{2}{\sqrt{1-x^2}} dx$

b. $\int \frac{5}{\sqrt{1-(3x)^2}} dx$

c. $\int \frac{1}{1+x^2} dx$

d. $\int \frac{1}{25+x^2} dx$

2. Find:

a. $\int \frac{3}{3x-2} dx$

b. $\int \frac{\sin x}{\cos x} dx$

c. $\int \frac{3x}{x^2+3x+2} dx$

3. Find:

a. $\int_0^{\frac{\pi}{4}} \sec^2 x dx$

b. $\int_0^{\frac{\pi}{12}} \sec^2 3x dx$

4. Using the substitution $u = x^2 - 1$, find $\int \frac{x}{(x^2-1)^{\frac{5}{2}}} dx$.

5. Using the substitution $u = \tan x$, find $\int 5 \sec^2 x \tan^4 x dx$.

6. Use the method of integration by parts to evaluate $\int_0^{\frac{\pi}{4}} 2x \sin x dx$.

7. Using the method of integration by parts to find $\int \ln x dx$.

8. Evaluate $\int_0^1 x^2 e^x dx$.