

### Integration worksheet

Calculate the following antiderivatives using no more than the elementary antiderivatives (such as those below) and  $u$ -substitution (we'll learn more techniques in Chapter 6; don't use those).

Some important elementary antiderivatives:

$\int x^N dx = x^{N+1}/(N+1) + C, N \neq -1$	$\int \frac{1}{\sqrt{1-x^2}} dx = \arcsin(x) + C$
$\int 1/x dx = \ln x  + C$	$\int \frac{1}{x^2+1} dx = \arctan(x) + C$
$\int e^x dx = e^x + C$	$\int \frac{1}{\sqrt{x^2+1}} dx = \sinh^{-1}(x) + C$
$\int \cos(x) dx = \sin(x) + C$	$\int \frac{1}{\sqrt{x^2-1}} dx = \cosh^{-1}(x) + C$
$\int \sin(x) dx = -\cos(x) + C$	$\int \frac{1}{1-x^2} dx = \tanh^{-1}(x) + C$

1.  $\int \frac{1}{3+x^2} dx$

10.  $\int \frac{1}{\sqrt{3-x^2}} dx$

2.  $\int \frac{1}{1+3x^2} dx$

11.  $\int \frac{1}{\sqrt{1-3x^2}} dx$

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

12.  $\int \frac{x}{\sqrt{3-x^2}} dx$

4.  $\int \frac{1}{3-x^2} dx$

13.  $\int \frac{1}{\sqrt{x^2-3}} dx$

5.  $\int \frac{1}{1-3x^2} dx$

14.  $\int \frac{1}{\sqrt{3x^2-1}} dx$

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

15.  $\int \frac{x}{\sqrt{x^2-3}} dx$

7.  $\int \frac{1}{\sqrt{3+x^2}} dx$

16.  $\int x\sqrt{x^2-3} dx$

8.  $\int \frac{1}{\sqrt{1+3x^2}} dx$

17.  $\int x\sqrt{3-x^2} dx$

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

18.  $\int x\sqrt{1-3x^2} dx$

19.  $\int \frac{1-x}{1-x^2} dx$
20.  $\int \frac{1-x}{2x-x^2} dx$
21.  $\int \frac{x^3}{1+x^8} dx$
22.  $\int \frac{(1+x)^2}{x} dx$
23.  $\int \frac{x}{(1+x)^2} dx$
24.  $\int x\sqrt{1-x} dx$
25.  $\int \frac{1}{x \ln(x)} dx$
26.  $\int \frac{1}{(1+(\ln(x))^2)x} dx$
27.  $\int \frac{x^2}{\sqrt{1-x^6}} dx$
28.  $\int \frac{x^5}{\sqrt{1-x^6}} dx$
29.  $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$
30.  $\int \frac{e^x}{(1+e^x)^2} dx$
31.  $\int \frac{(1+e^x)^2}{e^x} dx$
32.  $\int \frac{e^x}{1+e^{2x}} dx$
33.  $\int \frac{\tan^{-1}(x)}{1+x^2} dx$
34.  $\int \frac{3^x}{3^x+4} dx$
35.  $\int \frac{3^x}{3^{2x}+1} dx$
36.  $\int \frac{1}{3x+4} dx$
37.  $\int \cosh(x) \sinh(x) dx$
38.  $\int \coth(x) dx$
39.  $\int \frac{\sin(x)}{1+\cos^2(x)} dx$
40.  $\int \cos(x)(1-\cos^2(x)) dx$
41.  $\int \tan(x) \ln(\cos(x)) dx$
42.  $\int 7^{\sinh(x)} \cosh(x) dx$
43.  $\int \frac{\csc^2(x)}{1+\cot(x)} dx$
44.  $\int \tan(x) \sec(x) dx$
45.  $\int \tan^2(x) \csc(x) dx$
46.  $\int \coth^3(x) \operatorname{sech}^2(x) dx$