

1. Find each indefinite integral:

a. $\int (x^3 + 6x + 1) dx$

b. $\int (1 - t)(2 + t^2) dt$

c. $\int (2 - \sqrt{x})^2 dx$

d. $\int \frac{\sin(x)}{1 - \sin^2(x)} dx$

e. $\int 3e^u + \sec^2(u) du$

f. $\int x(1 + 2x^4) dx$

g. $\int (2e^x + 4 \cos(x)) dx$

h. $\int x\sqrt{x} dx$

i. $\int \cos(x) - 2 \sin(x) dx$

j. $\int \frac{y+5y^7}{y^3} dy$

k. $\int \frac{1+4x}{\sqrt{2x^2+x+1}} dx$

l. $\int (3x - 2)^{20} dx$

m. $\int x^2(x^3 + 5)^9 dx$

n. $\int \sqrt{4 - t} dt$

o. $\int \frac{e^x}{e^x + 1} dx$

p. $\int \frac{\tan^{-1}(x)}{1+x^2} dx$

q. $\int \frac{[\ln(x)]^2}{x} dx$

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

s. $\int \frac{z^2}{\sqrt[3]{1+z^3}} dz$

t. $\int \sec^3(x) \tan(x) dx$

u. $\int \sin^3(\theta) \cos(\theta) d\theta$

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

w. $\int x\sqrt{x-1} dx$

x. $\int \frac{x}{\sqrt[4]{x+2}} dx$

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

z. $\int x^5 \sqrt{x^3 + 1} dx$

2. Evaluate each definite integral:

a. $\int_0^2 (6x^2 - 4x + 5) dx$

b. $\int_{-3}^0 (5y^4 - 6y^2 + 14) dy$

c. $\int_{-2}^2 (3u + 1)^2 du$

d. $\int_0^9 \sqrt{2t} dt$

e. $\int_1^{64} \frac{1 + \sqrt[3]{x}}{\sqrt{x}} dx$

f. $\int_{\frac{\pi}{4}}^{\frac{\pi}{3}} \sec(\theta) \tan(\theta) d\theta$

g. $\int_0^7 \sqrt{4 + 3x} dx$

h. $\int_0^{\frac{\pi}{3}} \frac{\sin(\theta)}{\cos^2(\theta)} d\theta$

i. $\int_{-2}^1 x^2 \sqrt{x+3} dx$

j. $\int_0^{13} \frac{dx}{\sqrt[3]{(1+2x)^2}}$

k. $\int_{\frac{1}{6}}^{\frac{1}{2}} \csc(\pi t) \cot(\pi t) dt$

l. $\int_0^{\sqrt{3}} x^5 \sqrt{x^2 + 1} dx$