

Find the following indefinite integrals.

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

2. $\int \sin^2 2x \cos^2 2x dx$

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

$$4. \int \frac{t^3 e^{t^2}}{(t^2 + 1)^2} dx$$

$$5. \int \frac{5}{(\sqrt{x} \ln x)^2} dx$$

$$6. \int \frac{2x-5}{x^2+2x+2} dx$$

$$7. \int 4 \arccos x dx$$

$$8. \int \tan^3 2\theta \sec^3 2\theta d\theta$$

$$9. \int \sec^3 \pi x dx$$

10. $\int \frac{\sin^5 x}{\sqrt{\cos x}} dx$

11. $\int \frac{1}{(x^2 + 3)^{3/2}} dx$

$$12. \quad \int (y+1)\sqrt{1-y} dy$$

$$13. \quad \int \frac{x+3}{x^2+6x-5} dx$$

$$14. \quad \int \left(x + \frac{1}{x}\right)^2 dx$$

15. $\int \frac{\ln(x^3)}{x} dx$

16. $\int \frac{1}{x^{2/3} (1+x^{1/3})} dx$

Evaluate the following definite integrals.

17.
$$\int_0^{\sqrt{3}/2} \frac{1}{(1-t^2)^{5/2}} dt$$

18.
$$\int_0^{\pi/3} \tan^2 x dx$$

19. $\int_0^2 e^{-x} \cos x dx$

20. $\int_0^{\sqrt{3}} \frac{1}{\sqrt{x^2 + 1}} dx$

$$21. \int_0^{\pi/2} \frac{\cos x}{1 + \sin^2 x} dx$$

$$22. \int_0^{1/\sqrt{2}} \frac{\arcsin x}{\sqrt{1-x^2}} dx$$