

Find the following indefinite integrals.

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

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

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

$$4. \int \frac{5t^2 - t - 1}{2 - t} dx$$

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

$$6. \int (4x^3 - x) \sqrt{2x^4 - x^2 + 5} dx$$

$$7. \int \frac{2x^3 - x^2 + 4x^{3/4} - x^{-1/2} + 1}{\sqrt[4]{x}} dx$$

$$8. \int \frac{1}{1 - \sin \theta} d\theta$$

$$9. \int (1-x^2)^3 dx$$

$$10. \int \frac{2x^2 + 3x - 20}{2x - 5} dx$$

$$11. \int \csc 3\theta \cot 3\theta d\theta$$

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

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

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

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

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

Evaluate the following definite integrals.

$$17. \int_{\pi/6}^{\pi/4} \cot^3 x \csc^2 x dx$$

$$18. \int_1^2 \frac{e^x + e^{-x}}{e^x - e^{-x}} dx$$

$$19. \int_0^{2e} \frac{x}{1-x} dx$$

$$20. \int_{\pi/3}^{\pi/2} (\sec^2 x) dx$$

21.
$$\int_1^{\pi} \left(3 - \frac{1}{2x} + \tan 2x \right) dx$$

22.
$$\int_{-\pi/2}^{\pi/2} \sin x \cos^2 x dx$$