

Basic Integration Problems

I. Find the following integrals.

1. $\int(5x^2 - 8x + 5)dx$

2. $\int(-6x^3 + 9x^2 + 4x - 3)dx$

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

4. $\int\left(\frac{8}{x} - \frac{5}{x^2} + \frac{6}{x^3}\right)dx$

5. $\int\left(\sqrt{x} + \frac{1}{3\sqrt{x}}\right)dx$

6. $\int(12x^{\frac{3}{4}} - 9x^{\frac{5}{3}})dx$

7. $\int\frac{x^2 + 4}{x^2}dx$

8. $\int\frac{1}{x\sqrt{x}}dx$

9. $\int(1 + 3t)t^2 dt$

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

11. $\int y^2 \sqrt[3]{y} dy$

12. $\int d\theta$

13. $\int 7 \sin(x) dx$

14. $\int 5 \cos(\theta) d\theta$

15. $\int 9 \sin(3x) dx$

16. $\int 12 \cos(4\theta) d\theta$

17. $\int 7 \cos(5x) dx$

18. $\int 4 \sin\left(\frac{x}{3}\right) dx$

19. $\int 4e^{-7x} dx$

20. $\int 9e^{\frac{x}{4}} dx$

21. $\int -5 \cos \pi x dx$

22. $\int -13e^{6t} dt$

II. Evaluate the following definite integrals.

1. $\int_1^4 (5x^2 - 8x + 5)dx$

2. $\int_1^9 (x^{\frac{3}{2}} + 2x + 3)dx$

3. $\int_4^9 (\sqrt{x} + \frac{1}{3\sqrt{x}})dx$

4. $\int_1^4 \frac{5}{x^3} dx$

5. $\int_{-1}^2 (1 + 3t)t^2 dt$

6. $\int_{-2}^1 (2t^2 - 1)^2 dt$