

Evaluate each indefinite integral.

1) $\int 8x \, dx$

2) $\int (6x^2 + 4x) \, dx$

3) $\int (5x^4 + 6x + 3) \, dx$

4) $\int -20x^3 \, dx$

5) $\int 5\sin x \, dx$

6) $\int 3\sec x \tan x \, dx$

7) $\int -5\csc x \cot x \, dx$

8) $\int -3\sin x \, dx$

Evaluate each definite integral.

9) $\int_0^3 (x + 2) \, dx$

10) $\int_{-3}^{-1} (-x^3 - 4x^2 - 4x - 4) \, dx$

11) $\int_0^{\frac{\pi}{6}} -\sec^2 x \, dx$

12) $\int_{-\frac{\pi}{3}}^0 -2\cos x \, dx$

13) $\int_0^4 (2x - 2) \, dx$

14) $\int_{-2}^3 (x^2 - 2) \, dx$

For each problem, find the average value of the function over the given interval.

15) $f(x) = -2x^2 - 8x - 3; [-4, -1]$

16) $f(x) = x; [2, 5]$

17) $f(x) = 2x + 1; [-4, 1]$

For each problem, find the values of c that satisfy the Mean Value Theorem for Integrals.

18) $f(x) = 2x + 1; [-4, 1]$

19) $f(x) = -2x + 1; [-3, 1]$

20) $f(x) = x^2 - 8x + 17; [3, 6]$