Sample Problems

Compute each of the following integrals.

1. $\displaystyle\int e^{-4x}\ dx$

2. $\displaystyle\int_0^8 e^{-4x}\ dx$

3. $\displaystyle\int \left(x^2 - 2\right)\left(x^3 - 6x\right)^{207}\ dx$

4. $\displaystyle\int \frac{(\ln x)^8 + 1}{x}\ dx$

5. $\displaystyle\int_1^{e^2} \frac{(\ln x)^8 + 1}{x}\ dx$

6. $\displaystyle\int \frac{3x}{\left(x^2 + 1\right)^7}\ dx$

7. $\displaystyle\int \frac{12x^3}{3x^4 + 1}\ dx$

8. $\displaystyle\int (-3x + 4)\, e^{-3x^2 + 8x}\ dx$

9. $\displaystyle\int_0^2 (-3x + 4)\, e^{-3x^2 + 8x}\ dx$

10. $\displaystyle\int \frac{20x}{\left(x^2 + 1\right)^{20}}\ dx$

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

12. $\displaystyle\int \frac{1}{\sqrt{2x - 1}}\ dx$

13. $\displaystyle\int \frac{x}{\sqrt{x + 1}}\ dx$

14. $\displaystyle\int_0^{15} \frac{x}{\sqrt{x + 1}}\ dx$

15. $\displaystyle\int_0^3 \frac{e^x - e^{-x}}{e^x + e^{-x}}\ dx$

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

17. $\displaystyle\int_0^1 \frac{x^2 - 8x + 3}{x + 2}\ dx$

18. $\displaystyle\int_0^\infty x e^{-3x^2}\ dx$

19. $\displaystyle\int_0^\infty 3 e^{-3x}\ dx$

20. $\displaystyle\int \frac{2x + 5}{\sqrt{x - 3}}\ dx$

Practice Problems

Compute each of the following integrals.

1. $\displaystyle\int 200x \left(2x^2 - 5\right)^{99}\ dx$

2. $\displaystyle\int \frac{e^x}{\left(e^x + 2\right)^3}\ dx$

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

4. $\displaystyle\int_0^1 \frac{x + 1}{x^2 + 2x + 3}\ dx$

5. $\displaystyle\int \sqrt{3x - 2}\ dx$

6. $\displaystyle\int \frac{x^2}{\left(x^3 + 5\right)^{10}}\ dx$

7. $\displaystyle\int \frac{1}{x \ln x}\ dx$

8. $\displaystyle\int x^3\, 2^{x^4 - 1}\ dx$

9. $\displaystyle\int_{-1}^1 (x + 2)\left(x^2 + 4x - 3\right)^3\ dx$

10. $\displaystyle\int \frac{x - 1}{\sqrt{x + 1}}\ dx$

11. $\displaystyle\int_3^8 \frac{x - 1}{\sqrt{x + 1}}\ dx$

12. $\displaystyle\int_1^3 \frac{1}{3x - 2}\ dx$