

u-Substitution and Integration by Parts Problems

Evaluate each integral by using substitution or integration by parts.

1. $\int \frac{16x}{\sqrt{8x^2+1}} dx$
2. $\int x \sin \frac{x}{2} dx$
3. $\int 3\sqrt{\sin v} \cos v dv$
4. $\int_0^1 \frac{16x}{8x^2+2} dx$
5. $\int \theta \cos \pi\theta d\theta$
6. $\int \frac{dx}{\sqrt{x}(\sqrt{x}+1)}$
7. $\int \sec^2 \frac{t}{3} dt$
8. $\int \frac{1}{\theta^2} \sin \frac{1}{\theta} d\theta$
9. $\int t^2 \cos t dt$
10. $\int x \sec^2 x dx$
11. $\int_0^1 x\sqrt{1-x} dx$
12. $\int \sin^{-1} y dy$
13. $\int te^{-t} dt$
14. $\int \ln t dt$
15. $\int \frac{1-2t^3}{t^3} dt$
16. $\int e^{\tan x} \sec^2 x dx$
17. $\int z(\ln z)^2 dz$
18. $\int_1^{e^{1/3}} \frac{dx}{x \cos(\ln x)}$
19. $\int_0^{\pi/2} \theta^2 \sin 2\theta d\theta$
20. $\int \sin^{-1} y dy$
21. $\int (x^2 - 5x)e^x dx$
22. $\int \frac{t^2 + 3t + 4}{t-2} dt$
23. $\int_0^1 \frac{x^3 + x^2 - x - 3}{x+2} dx$
24. $\int \frac{e^{\sqrt{t}}}{\sqrt{t}} dt$

Evaluate each integral by completing the square and using a substitution to reduce it to a basic form.

25. $\int \cos^2 d\theta$
26. $\int_2^4 \frac{2}{x^2 - 6x + 10} dx$
27. $\int \frac{dt}{\sqrt{-t^2 + 4t - 3}}$

Evaluate each integral by using algebra, a trig identity, and substitution to reduce it to a basic form.

28. $\int (\sec x + \cot x)^2 dx$
29. $\int_0^{\pi} \sin^2 x dx$
30. $\int_0^{\pi/2} \frac{\cos^3}{\sqrt{\sin x}} dx$