

Larson 7.1 Integration Review

Name: _____

Copy exercises and show all work on separate paper.

In Exercises 15–46, evaluate the indefinite integral.

15. $\int (-2x + 5)^{3/2} dx$

16. $\int \frac{2}{(t-9)^2} dt$

17. $\int \left[v + \frac{1}{(3v-1)^3} \right] dv$

18. $\int x\sqrt{4-2x^2} dx$

19. $\int \frac{t^2-3}{-t^3+9t+1} dt$

20. $\int \frac{2x}{x-4} dx$

21. $\int \frac{x^2}{x-1} dx$

22. $\int \frac{x+1}{\sqrt{x^2+2x-4}} dx$

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

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

25. $\int (1+2x^2)^2 dx$

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

27. $\int x(\cos 2\pi x^2) dx$

28. $\int \sec 4u du$

29. $\int \csc \pi x \cot \pi x dx$

30. $\int \frac{\sin x}{\sqrt{\cos x}} dx$

31. $\int e^{5x} dx$

32. $\int \csc^2 x e^{\cot x} dx$

33. $\int \frac{2}{e^x + 1} dx$

34. $\int \frac{1}{2e^x - 3} dx$

35. $\int \frac{1 + \sin x}{\cos x} dx$

36. $\int \frac{1}{\sec x - 1} dx$

37. $\int \frac{2t-1}{t^2+4} dt$

38. $\int \frac{3}{t^2+1} dt$

39. $\int \frac{-1}{\sqrt{1-(2t-1)^2}} dt$

40. $\int \frac{1}{4+3x^2} dx$

41. $\int \frac{\tan(2/t)}{t^2} dt$

42. $\int \frac{e^{1/t}}{t^2} dt$

43. $\int \frac{3}{\sqrt{6x-x^2}} dx$

44. $\int \frac{1}{(x-1)\sqrt{4x^2-8x+3}} dx$

45. $\int \frac{4}{4x^2+4x+65} dx$

46. $\int \frac{1}{\sqrt{2x^2-2x-1}} dx$

In Exercises 47–52, solve the differential equation.

47. $\frac{dy}{dx} = (1+e^x)^2$

48. $\frac{dr}{dt} = \frac{(1+e^t)^2}{e^t}$

49. $\frac{ds}{dt} = \frac{t}{\sqrt{1-t^4}}$

50. $\frac{dy}{dt} = \frac{1}{x\sqrt{4x^2-1}}$

51. $(4+\tan^2 x)y' = \sec^2 x$

52. $y' = \tan^2 2x$

In Exercises 53–60, evaluate the definite integral.

53. $\int_0^{\pi/4} \cos 2x dx$

54. $\int_0^{\pi} \sin^2 t \cos t dt$

55. $\int_0^1 xe^{-x^2} dx$

56. $\int_1^e \frac{1-\ln x}{x} dx$

57. $\int_0^4 \frac{2x}{\sqrt{x^2+9}} dx$

58. $\int_1^2 \frac{x-2}{x} dx$

59. $\int_0^{2/\sqrt{3}} \frac{1}{4+9x^2} dx$

60. $\int_0^4 \frac{1}{\sqrt{25-x^2}} dx$

Answers to Odd-Numbered Exercises

55. $\frac{2}{1} (1 - e^{-1}) \approx 0.316$ 57. 4 59. $\frac{18}{\pi}$
51. $y = \frac{1}{2} \arctan \frac{2}{\tan x} + C$ 53. $\frac{2}{1}$
47. $y = \frac{1}{2} e^{2x} + 2e^x + x + C$ 49. $s = \frac{1}{2} \arcsin t^2 + C$
43. $3 \arcsin \frac{x-3}{2x+1} + C$ 45. $\frac{1}{4} \arctan \frac{8}{2x+1} + C$
39. $-\frac{1}{2} \arcsin(2t-1) + C$ 41. $\frac{1}{2} \ln \left| \cos \frac{t}{2} \right| + C$
37. $\ln(t^2+4) - \frac{1}{2} \arctan \frac{t}{2} + C$
33. $2 \ln(1+e^x) + C$ 35. $\ln |\sec x(\sec x + \tan x)| + C$
29. $-\frac{\pi}{1} \csc \pi x + C$ 31. $\frac{5}{1} e^{5x} + C$
25. $\frac{15}{x} (12x^4 + 20x^2 + 15) + C$ 27. $\frac{4\pi}{1} \sin 2\pi x^2 + C$
21. $\frac{1}{2} x^2 + x + \ln |x-1| + C$ 23. $\frac{1}{3} \ln \left| \frac{3x+1}{3x-1} \right| + C$
19. $-\frac{1}{3} \ln | -t^3 + 9t + 1 | + C$
17. $\frac{1}{2} v^2 - \frac{6(3v-1)^2}{1} + C$
- $n = \sin x$
13. $\int e^u du$ 15. $-\frac{5}{1} (-2x + 5)^{5/2} + C$
- $n = t, a = 1$ 11. $\int \sin u du$
9. $\frac{du}{\sqrt{a^2 - u^2}} = \frac{1}{t^2}$