

Exercise 7-4

1. $\ln \left| \frac{x}{1+x} \right| + C$ 3. $\frac{1}{3+x} + 2 \ln \left| \frac{5+2x}{3+x} \right| + C$ 5. $\frac{2(x-32)}{3} \sqrt{16+x} + C$ 7. $-\ln \left| \frac{1+\sqrt{1-x^2}}{x} \right| + C$

9. $\frac{1}{2} \ln \left| \frac{x}{2+\sqrt{x^2+4}} \right| + C$ 11. $\frac{1}{3} x^3 \ln x - \frac{1}{9} x^3 + C$ 13. $x - \ln|1+e^x| + C$ 15. $9 \ln \frac{3}{2} - 2 \approx 1.6492$

17. $\frac{1}{2} \ln \frac{12}{5} \approx 0.4377$ 19. $\ln 3 \approx 1.0986$ 21. $-\frac{\sqrt{4x^2+1}}{x} + 2 \ln|2x + \sqrt{4x^2+1}| + C$ 23. $\frac{1}{2} \ln|x^2 + \sqrt{x^4-16}| + C$

25. $\frac{1}{6}(x^3 \sqrt{x^6+4} + 4 \ln|x^3 + \sqrt{x^6+4}|) + C$ 27. $-\frac{\sqrt{4-x^4}}{8x^2} + C$ 29. $\frac{1}{5} \ln \left| \frac{3+4e^x}{2+e^x} \right| + C$

31. $\frac{2}{3}(\ln x - 8)\sqrt{4+\ln x} + C$ 33. $\frac{1}{5}x^2e^{5x} - \frac{2}{25}xe^{5x} + \frac{2}{125}e^{5x} + C$ 35. $-x^3e^{-x} - 3x^2e^{-x} - 6xe^{-x} - 6e^{-x} + C$

37. $x(\ln x)^3 - 3x(\ln x)^2 + 6x \ln x - 6x + C$ 39. $\frac{64}{3}$ 41. $\frac{1}{2} \ln \frac{9}{5} \approx 0.2939$ 43. $\frac{-1-\ln x}{x} + C$

45. $\sqrt{x^2-1} + C$ 47. 31.38 49. 5.48 51. $3,000 + 1,500 \ln \frac{1}{3} \approx \$1,352$

53. $C(x) = 200x + 1,000 \ln(1 + 0.05x) + 25,000$; 608; \$198,773

55. $100,000e - 250,000 \approx \$21,828$

59. 0.1407

61. As the area bounded by the two curves gets smaller, the Lorenz curve approaches $y = x$ and the distribution of income approaches perfect equality—all persons share equally in the income available.

