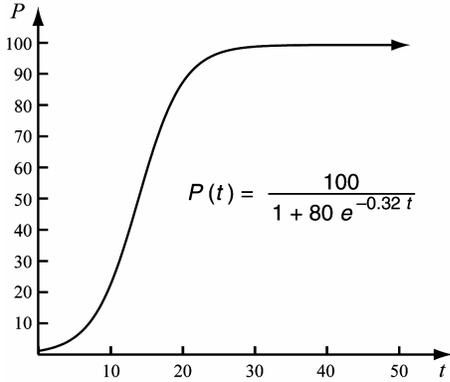


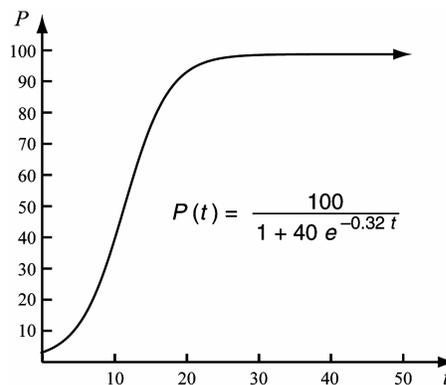
CHAPTER 3, FORM A

1. $15e^{3x}$
2. $\frac{7(\ln x)^6}{x}$
3. $-7x^6e^{-x^7}$
4. $\frac{1}{x}$
5. $e^x - 15x^4$
6. $\frac{4e^x}{x} + 4e^x \ln x$
7. $(\ln 10)10^x - (\ln 5)5^x$
8. $\frac{1}{(\ln 16)x}$
9. -0.5283
10. 0.8617
11. 1.9183
12. $W(t) = 7e^{5t}$
13. 17.3% per hour
14. 19.7 yr
15. (a) 2.2% ; $C(t) = 1.20e^{0.022t}$
 (b) $\$1.37$; $\$1.56$
16. (a) $N(t) = 200,000e^{-.18t}$
 (b) $33,060$;
 (c) 3.85 hr
17. 14 days
18. 2.5672% / min
19. (a) 1.23%
 (b) 1.7% ; 5.8% ; 88.3%
 (c) $P'(t) = \frac{2560e^{-0.32t}}{(1+80e^{-0.32t})^2}$
 (d) $P(t) = \frac{100}{1+80e^{-0.32t}}$
- 
20. $\$18,009.07$
21. (a) $E(x) = 0.25x$;
 (b) 0.75 ; inelastic;
 (c) 3 ; elastic;
 (d) increase;
 (e) $\$4$
22. $4(\ln x)^2$
23. Maximum is $\frac{1}{e^4} \approx 0.018$; Minimum is zero
24. 0
25. (a) $y = 13290.68018 \cdot 1.0478120676^x$;
 $y = 13290.68018e^{0.0467029169t}$
 (b) $\$28,059$; $\$32,279$
 (c) 26.1 years after 1996
 (d) 14.8 yr

CHAPTER 3, FORM B

1. $28e^{4x}$
2. $\frac{5(\ln x)^4}{x}$
3. $5x^4e^{x^5}$
4. $\frac{1}{x}$
5. $e^x + 35x^6$
6. $\frac{9e^x}{x} + 9e^x \ln x$
7. $(\ln 3)3^x + (\ln 4)4^x$
8. $\frac{1}{(\ln 13)x}$
9. 1.3023
10. 1.548
11. -0.5283
12. $M(t) = 4e^{10t}$
13. 8.7% per hour
14. 13.5 yr
15. (a) 4.7% ; $C(t) = 1.56e^{0.047t}$
(b) \$2.07; \$2.74
16. (a) $A(t) = 5e^{-0.22t}$
(b) 0.86cc
(c) 3.15 hr
17. 20 minutes
18. 3.1507% / yr

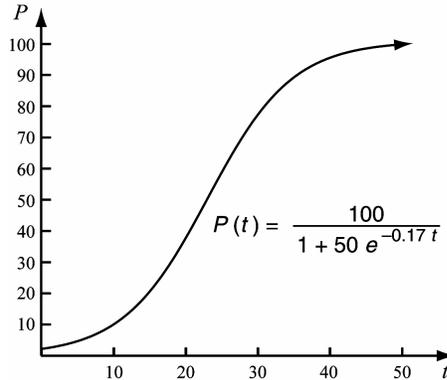
19. (a) 2.44%
(b) 3.3%; 11.0%; 93.8%
(c) $P(t) = \frac{1280e^{-0.32t}}{(1 + 40e^{-0.32t})^2}$
(d) $P(t) = \frac{100}{1 + 40e^{-0.32t}}$



20. \$7,339,161.34
21. (a) $E(x) = 0.24x$;
(b) 1.2; elastic;
(c) 0.72; inelastic;
(d) decrease;
(e) \$4.17
22. $3(\ln x)^2$
23. Maximum is $\frac{1}{e^3} \approx 0.050$; Minimum is zero
24. 0
25. (a) $y = 3.977389175 \cdot 1.032437237^x$;
 $y = 3.977389175e^{0.0319222566t}$
(b) \$8.03; \$8.83
(c) 41.6 years after 1990
(d) 21.7 yr

CHAPTER 3, FORM C

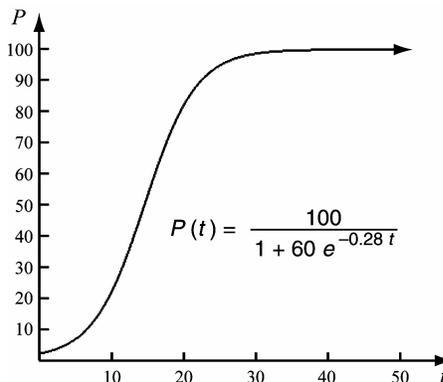
1. $8e^{2x}$
2. $\frac{9(\ln x)^8}{x}$
3. $28x^6e^{4x^7}$
4. $\frac{1}{x}$
5. $e^x - 6x^2$
6. $\frac{3e^x}{x} + 3e^x \ln x$
7. $(\ln 4)4^x - (\ln 8)8^x$
8. $\frac{1}{(\ln 7)x}$
9. 0.5646
10. -1.2770
11. 1.0686
12. $J(t) = 5e^{4t}$
13. 13.9% per hour
14. 15.8 yr
15. (a) 5.7%; $C(t) = 0.66e^{0.057t}$
(b) \$0.93; \$1.31
16. (a) $N(t) = 1,500,000e^{-0.45t}$
(b) 6775
(c) 1.54 hr
17. 24 days
18. 13.0782% / year
19. (a) 1.96%
(b) 2.3%; 4.5%; 37.5%
(c) $P'(t) = \frac{850e^{-0.17t}}{(1+50e^{-0.17t})^2}$
(d) $P(t) = \frac{100}{1+50e^{-0.17t}}$



20. \$197,642.71
21. (a) $E(x) = 0.3x$
(b) 1.8; elastic;
(c) 0.9; inelastic;
(d) decrease
(e) \$3.33
22. $5(\ln x)^2$
23. Maximum is $\frac{3125}{e^5} \approx 21.056$; Minimum is zero
24. 0
25. (a) $y = 6815.347837 \cdot 1.08435998^x$;
 $y = 6815.347837e^{0.0809899328x}$
(b) \$18,012; \$22,966
(c) 18.3 years after 2000
(d) 8.6 yr

CHAPTER 3, FORM D

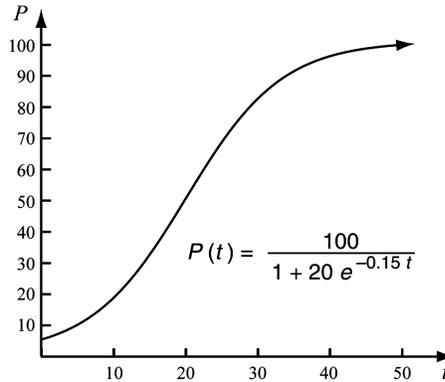
1. $30e^{5x}$
2. $\frac{8(\ln x)^7}{x}$
3. $-10xe^{-5x^2}$
4. $\frac{1}{x}$
5. $e^x + 12x^3$
6. $\frac{7e^x}{x} + 7e^x \ln x$
7. $(\ln 19)19^x - (\ln 6)6^x$
8. $\frac{1}{(\ln 18)x}$
9. 2.7925
10. 0.5
11. -1.5
12. $Q(t) = 2e^{8t}$
13. 6.9% per hour
14. 11.1 yr
15. (a) 2.8%; $C(t) = 1.21e^{0.028t}$
(b) \$1.501; \$1.79
16. (a) $N(t) = 150,000e^{-0.30t}$
(b) 33,470
(c) 2.3 days
17. 8 days
18. 3.4657% / min
19. (a) 1.64%
(b) 2.2%; 6.3%; 81.8%
(c) $P'(t) = \frac{1680e^{-0.28t}}{(1+60e^{-0.28t})^2}$
(d) $P(t) = \frac{100}{1+60e^{-0.28t}}$



20. \$16,095,221.68
21. (a) $E(x) = 0.1x$;
(b) 0.8; inelastic;
(c) 1.5; elastic;
(d) increase;
(e) \$10
22. $2(\ln x)^2$
23. Maximum is $\frac{4}{e^2} \approx 0.541$; Minimum is zero
24. 0
25. (a) $y = 13344.24679 \cdot 1.023253549^x$;
 $y = 13344.24679e^{0.0229873047t}$
(b) 17,583; 18,838
(c) 27.3 years after 2000
(d) 30.2 yr

CHAPTER 3, FORM E

1. $16e^{8x}$
2. $\frac{6(\ln x)^5}{x}$
3. $-3x^2e^{x^3}$
4. $\frac{1}{x}$
5. $e^x - 21x^2$
6. $\frac{5e^x}{x} + 5e^x \ln x$
7. $(\ln 11)11^x + (\ln 2)2^x$
8. $\frac{1}{(\ln 3)x}$
9. 2.585
10. 0.5
11. 3.085
12. $S(t) = 2e^{7t}$
13. 3.5% per hour
14. 12.6 yr
15. (a) 3.8%; $C(t) = 1.74e^{0.038t}$
(b) \$2.36; \$2.96
16. (a) $A(t) = 3e^{-0.15t}$
(b) 0.5 cc
(c) 4.6 hr
17. 12 years
18. 2.8881% / day
19. (a) 4.8%
(b) 5.49%; 9.57%; 50.11%
(c) $P'(t) = \frac{300e^{-0.15t}}{(1 + 20e^{-0.15t})^2}$
(d) $P(t) = \frac{100}{1 + 20e^{-0.15t}}$



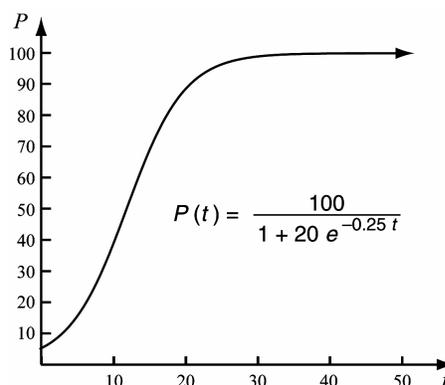
20. \$2,786,434.91
21. (a) $E(x) = 0.4x$;
(b) 0.8; inelastic;
(c) 2.0; elastic;
(d) increase;
(e) \$2.50
22. $7(\ln x)^2$
23. Maximum is $\frac{1}{e^2} \approx 0.13$; Minimum is zero
24. 0
25. (a) $y = 142897.0435 \cdot 1.023432098^x$;
 $y = 142897.0435e^{0.023161781x}$
(b) \$188,683; \$202,259
(c) 24.1 years after 2000
(d) 29.9 yr

CHAPTER 3, FORM F

1. $24e^{4x}$
2. $\frac{3(\ln x)^2}{x}$
3. $-4x^3e^{-x^4}$
4. $\frac{1}{x}$
5. $e^x - 32x^3$
6. $\frac{10e^x}{x} + 10e^x \ln x$
7. $(\ln 2)2^x + (\ln 5)5^x$
8. $\frac{1}{(\ln 21)x}$
9. -1.2925
10. 2.9535
11. 3.322
12. $N(t) = 2e^{5t}$
13. 9.9% per hour
14. 18.3 yr
15. (a) 6.2% ; $C(t) = 1.29e^{0.062t}$
(b) $\$2.12$; $\$3.07$
16. (a) $A(t) = 7e^{-0.55t}$
(b) 0.78 cc
(c) 1.26 hr
17. 11 yr
18. 8.5574% /day
19. (a) 4.8%
(b) 6.0% ; 14.9% ; 88.1%

$$(c) P'(t) = \frac{500e^{-0.25t}}{(1 + 20e^{-0.25t})^2}$$

$$(d) P(t) = \frac{100}{1 + 20e^{-0.25t}}$$



20. $\$9139.31$
21. (a) $E(x) = 0.25x$
(b) 1.5 ; elastic;
(c) 0.75 ; inelastic;
(d) decrease;
(e) $\$4$
22. $6(\ln x)^2$
23. Maximum is $\frac{4}{e^2} \approx 0.541$; Minimum is zero
24. 0
25. (a) $y = 2561.180776 \cdot 1.08092484^x$;
 $y = 2561.180776e^{0.077817008x}$
(b) $\$6516$; $\$8229.50$
(c) 14.6 years after 2000
(d) 8.9 yr