Answers to All Homework Questions : Sections 5.1, 5.3, 5.5
Applied Finite Mathematics 3rd Edition, R. Sekhon and R. Bloom

For answers to selected (mostly odd numbered) questions from Sections 5.2 and 5.4 and for answers to all review questions from Review Section 5.6, see the Student Supplement.

Section 5.1

1) exponential 2) power 3) linear 4) linear

5) linear 6) exponential 7) power 8) exponential

9) exponential decay 10) exponential decay

11) exponential growth 12) exponential growth

13) $y = 127(0.7047)^t$ Decay rate is 29.53%

14) $y = 16(1.4918)^t$ Growth rate is 49.18%

15) $y = 17250(1.2712)^t$ Growth rate is 27.12%

16) $y = 4700(0.9324)^t$ Decay rate is 6.76%

17) Linear $y = 350000+7000t$; at t = 5 years ;the value of the home is ;$385,000

18) Exponential $y = 350000(1.02)^t$; at t = 5, ;the value of the house is $386,428.28

19) Exponential $y = 50000(0.94)^t$; at t = 10 years, the value is $26,930.76

20) Linear $y = 50000 - 3000t$ and at t = 10 years, the value is $20,000

21) Linear $y = 200 + 10t$ and at t = 7 years there are 270 bats

22) Exponential $y = 200(1.05)^t$ and at t = 7 years there are 281 bats

23) Exponential $y = 300(0.93)^t$ and at t = 6 years there are 194 birds

24) Linear $y = 300-20t$ and at t = 6 years there are 180 birds

25) $y = 400e^{0.26t}$ and at t = 7 days there are 2,469 microbes

26) $y = 28000e^{0.035t}$ and at t = 4 years the value of the machine is $32,207.66

27) $y = 4000\ e^{-0.12t}$ and at t = 10 years there are only 1,205 animals of this endangered species

28) $y = 12000\ e^{-0.2t}$ and at t = 3 years the value is $6,585.74

Section 5.3

1) $\log_3 81 = 4$ 2) $\log_{10} 100000 = 5$ or $\log 100000 = 5$

3) $\log_5 0.04 = -2$ 4) $\log_4 0.25 = -1$ 5) $\log_{16} 2 = \frac{1}{4}$

6) $\log_9 3 = \frac{1}{2}$ 7) $5^4 = 625$ 8) $2^{-5} = 1/32$

9) $11^3 = 1331$ 10) $10^{-4} = 0.0001$ 11) $64^{1/3} = 4$

12) $e^{1/2} = \sqrt{e}$ 13) $\log_5 15625 = x$ 14) $\log_9 x = 3$

15) $5^x = 125$ 16) $3^5 = x$ 17) $10^4 = y$

18) $\ln 10 = x$ 19) $x = e^{-1} = 1/e$ 20) $\ln y = 5$

21) $x = 5^3 = 125$ 22) $x = 2^{-2} = \frac{1}{4} = 0.25$ 23) $x = 10^{-3} = 1/1000 = 0.001$

24) $x = 3^6 = 279$ 25) $x = 25^{\frac{1}{2}} = 5$ 26) $x = 64^{1/3} = 4$

27) $\ln e^{1/3} = 1/3$ 28) $\ln e^{-2} = -2$ 29) $\ln e^{10} = 10$

30) $\log_{10}(10^e) = e$ 31) 1.30103 32) 3.73767

33) 1.06471 34) –0.30103 35) 2.58496

36) 2.36659 37) 25.67655 38 10.68831

Section 5.5

1) a) $y = 20000(1.05)^t$ b) \$35,917 c) 8.31 years

2) 109,135 people in the year 2000

3) \$55,974.12 initial value

4) a) $y = 75000(0.968)^t$ b) \$54,176.99 after 10 years (end of year 2020)

5) 13.8 months 6) 44,875 people

7) 9.35 years 8) 5.5 years

9) 2.268% annual growth rate 10) 29.63% hourly decay rate

11) 5.426% annual decay rate 12) 12.42 years

13) $y = 7900(1.6032)^t$ 14) $y = 4567\, e^{-0.4005t}$

15) $y = 18720\, e^{-0.38526t}$ 16) $y = 1200\,(0.925)^t$