

Section 5.4 (page 419)

Vocabulary Check (page 419)

1. solve

2. (a)  $x = y$  (b)  $x = y$  (c)  $x$  (d)  $x$

3. extraneous

1. (a) Yes (b) No 2. (a) No (b) No

3. (a) No (b) Yes (c) Yes, approximate

4. (a) Yes (b) No (c) Yes, approximate

5. (a) Yes, approximate (b) No (c) Yes

6. (a) Yes (b) No (c) No

7. (a) No (b) Yes (c) Yes, approximate

8. (a) Yes (b) Yes, approximate (c) No

9. 2 10. 5 11. -5 12. -3 13. 2

14. 5 15.  $\ln 2 \approx 0.693$  16.  $\ln 4 \approx 1.386$

17.  $e^{-1} \approx 0.368$  18.  $e^{-7} \approx 0.000912$  19. 64

20. 0.008 21. (3, 8) 22.  $(\frac{2}{3}, 9)$  23. (9, 2)

24. (5, 0) 25. 2, -1 26. -2, 4

27.  $\approx 1.618$ ,  $\approx -0.618$  28. 0, 1 29.  $\frac{\ln 5}{\ln 3} \approx 1.465$

30.  $\frac{\ln 16}{\ln 5} \approx 1.723$  31.  $\ln 5 \approx 1.609$

32.  $\ln \frac{91}{4} \approx 3.125$  33.  $\ln 28 \approx 3.332$

34.  $\frac{\ln 37}{\ln 6} \approx 2.015$  35.  $\frac{\ln 80}{2 \ln 3} \approx 1.994$

36.  $\frac{\ln 3000}{5 \ln 6} \approx 0.894$  37. 2 38.  $-\frac{\ln(0.10)}{3 \ln 4} \approx 0.554$

39. 4 40. 8 41.  $3 - \frac{\ln 565}{\ln 2} \approx -6.142$

42.  $\frac{-\ln 64 - \ln 431}{\ln 8} \approx -4.917$  43.  $\frac{1}{3} \log\left(\frac{3}{2}\right) \approx 0.059$

44.  $6 + \log \frac{7}{5} \approx 6.146$  45.  $1 + \frac{\ln 7}{\ln 5} \approx 2.209$

46.  $6 - \frac{\ln 5}{\ln 3} \approx 4.535$  47.  $\frac{\ln 12}{3} \approx 0.828$

$$48. \frac{\ln 50}{2} \approx 1.956 \quad 49. -\ln \frac{3}{5} \approx 0.511$$

$$50. -\frac{1}{4} \ln \frac{3}{40} \approx 0.648 \quad 51. 0 \quad 52. \ln \frac{25}{3} \approx 2.120$$

$$53. \frac{\ln \frac{8}{3}}{3 \ln 2} + \frac{1}{3} \approx 0.805 \quad 54. 3 - \frac{\ln \frac{7}{2}}{2 \ln 4} \approx 2.548$$

$$55. \ln 5 \approx 1.609 \quad 56. \ln 2 \approx 0.693; \ln 3 \approx 1.099$$

$$57. \ln 4 \approx 1.386 \quad 58. \text{No solution}$$

$$59. 2 \ln 75 \approx 8.635 \quad 60. \ln 7 \approx 1.946$$

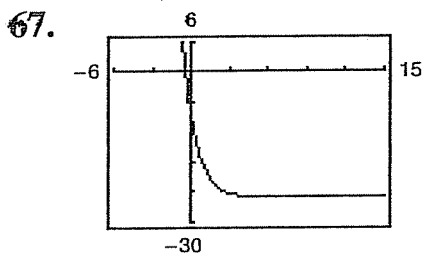
$$61. \frac{1}{2} \ln 1498 \approx 3.656 \quad 62. \frac{\ln 31}{6} \approx 0.572$$

$$63. \frac{\ln 4}{365 \ln(1 + \frac{0.065}{365})} \approx 21.330$$

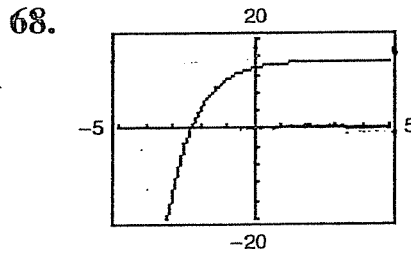
$$64. \frac{\ln 21}{9 \ln 3.938225} \approx 0.247$$

$$65. \frac{\ln 2}{12 \ln(1 + \frac{0.10}{12})} \approx 6.960$$

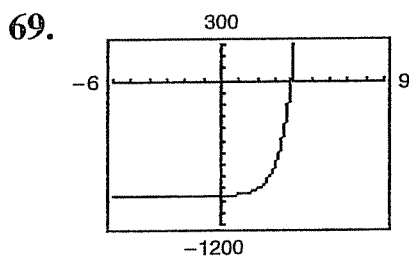
$$66. \frac{\ln 30}{3 \ln(16 - \frac{0.878}{26})} \approx 0.409$$



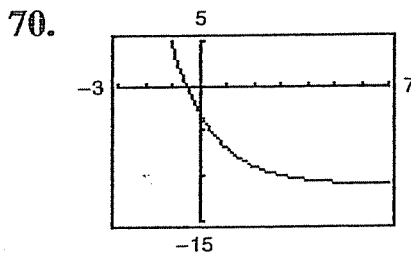
-0.427



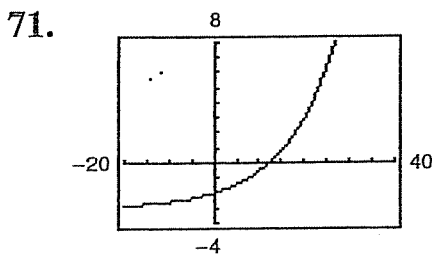
-2.322



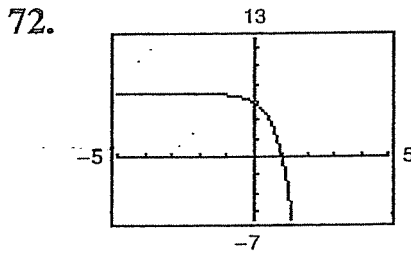
3.847



-0.478

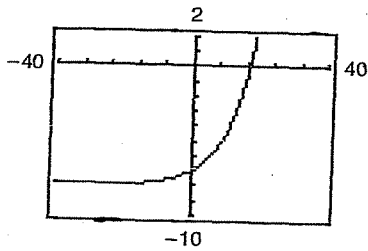


12.207



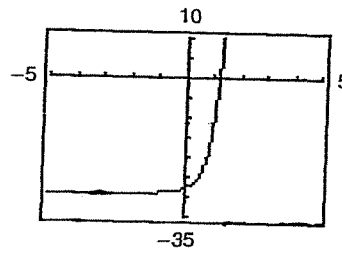
1.081

73.



16.636

74.



1.236

75.  $e^{-3} \approx 0.050$     76.  $e^2 \approx 7.389$     77.  $\frac{e^{2.4}}{2} \approx 5.512$

78.  $\frac{e}{4} \approx 0.680$     79. 1,000,000    80.  $\frac{100}{3} \approx 33.333$

81.  $\frac{e^{10/3}}{5} \approx 5.606$     82.  $e^{7/2} \approx 33.115$

83.  $e^2 - 2 \approx 5.389$     84.  $e^{10} + 8 = 22,034.466$

85.  $e^{-2/3} \approx 0.513$     86.  $e^{-4/3} \approx 0.264$

87.  $2(3^{11/6}) \approx 14.988$     88.  $10^{11/5} + 2 \approx 160.489$

89. No solution    90.  $\frac{-1 + \sqrt{1 + 4e}}{2} \approx 1.223$

91.  $1 + \sqrt{1 + e} \approx 2.928$     92.  $\frac{-3 + \sqrt{9 + 4e}}{2} \approx 0.729$

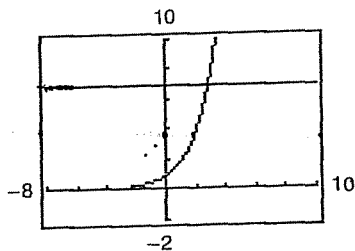
93. No solution    94.  $\frac{3 + \sqrt{13}}{2} \approx 3.303$     95. 7

96. No solution    97.  $\frac{-1 + \sqrt{17}}{2} \approx 1.562$     98. 2

99. 2    100. 9    101.  $\frac{725 + 125\sqrt{33}}{8} \approx 180.384$

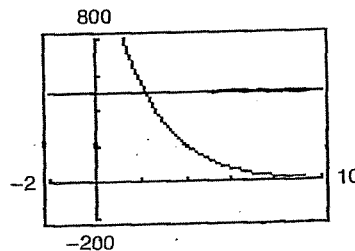
102.  $\frac{1225 + 125\sqrt{73}}{2} \approx 1146.500$

103.



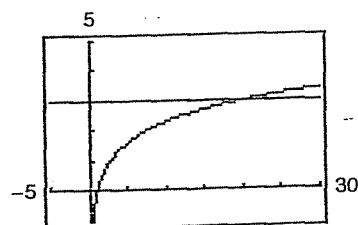
2.807

104.

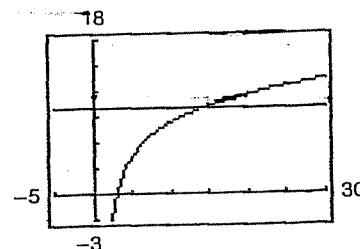


2.197

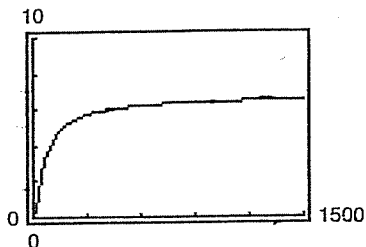
105.



106.



107. (a) 8.2 years (b) 12.9 years  
 108. (a) 5.8 years (b) 9.2 years  
 109. (a) 1426 units (b) 1498 units  
 110. (a) 303 units (b) 528 units  
 111. (a)



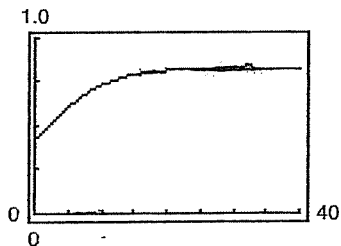
- (b)  $V = 6.7$ ; The yield will approach 6.7 million cubic feet per acre.  
 (c) 29.3 years

112. 12.76 inches    113. 2001    114. 2001

115. (a)  $y = 100$  and  $y = 0$ ; The range falls between 0% and 100%.

- (b) Males: 69.71 inches    Females: 64.51 inches

116. (a)



- (b) Horizontal asymptotes:  $P = 0$ ,  $P = 0.83$   
 The proportion of correct responses will approach 0.83 as the number of trials increases.

- (c)  $\approx 5$  trials

117. (a)

$x$	0.2	0.4	0.6	0.8	1.0
$y$	162.6	78.5	52.5	40.5	33.9