

34. $\begin{bmatrix} -2 & 17 \\ 15 & 12 \\ 18 & 46 \end{bmatrix}$ 36. $\begin{bmatrix} 3 & 0 & 0 \\ 0 & -4 & 0 \\ 0 & 0 & -10 \end{bmatrix}$

38. $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ 40. Not possible

42. $\begin{bmatrix} 252 & 30 \\ 298 & 452 \\ 217 & 180 \end{bmatrix}$ 44. Not possible

46. $\begin{bmatrix} -238 & 50 & -484 \\ 119 & 115 & 342 \\ 210 & 135 & 555 \end{bmatrix}$ 48. $\begin{bmatrix} 27 & -6 \\ -6 & -27 \end{bmatrix}$

50. $\begin{bmatrix} 12 & 6 \\ -4 & -2 \\ 20 & 10 \\ 28 & 14 \end{bmatrix}$

52. (a) 54. (a) 56. (d)

58. (a) $\begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 5 \\ 10 \end{bmatrix}$ (b) $\begin{bmatrix} -2 \\ 3 \end{bmatrix}$

60. (a) $\begin{bmatrix} -4 & 9 \\ 1 & -3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} -13 \\ 12 \end{bmatrix}$ (b) $\begin{bmatrix} -23 \\ -\frac{35}{3} \end{bmatrix}$

62. (a) $\begin{bmatrix} 1 & 1 & -3 \\ -1 & 2 & 0 \\ 0 & -1 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} -1 \\ 1 \\ 0 \end{bmatrix}$

(b) $\begin{bmatrix} 2a - 1 \\ a \\ a \end{bmatrix}$

64. (a) $\begin{bmatrix} 1 & -1 & 4 \\ 1 & 3 & 0 \\ 0 & -6 & 5 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 17 \\ -11 \\ 40 \end{bmatrix}$

(b) $\begin{bmatrix} 4 \\ -5 \\ 2 \end{bmatrix}$

66. $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$ 68. $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$ 70. Not possible

72. 2×2 74. Not possible 76. 2×2 78. 2×3

80. $\begin{bmatrix} 110 & 99 & 77 & 33 \\ 44 & 22 & 66 & 66 \end{bmatrix}$

82. [\$497,500 \$494,500]

The entries represent the costs of the three models of the product at each of the two warehouses.

84. $\begin{bmatrix} \$17.70 & \$15.00 \\ \$29.40 & \$25.00 \\ \$50.40 & \$43.00 \end{bmatrix}$

The entries are labor costs at each plant for each size of boat.

86. $P^3 = \begin{bmatrix} 0.300 & 0.175 & 0.175 \\ 0.308 & 0.433 & 0.217 \\ 0.392 & 0.392 & 0.608 \end{bmatrix}$

$P^4 = \begin{bmatrix} 0.250 & 0.188 & 0.188 \\ 0.315 & 0.377 & 0.248 \\ 0.435 & 0.435 & 0.565 \end{bmatrix}$

$P^5 = \begin{bmatrix} 0.225 & 0.194 & 0.194 \\ 0.314 & 0.345 & 0.267 \\ 0.461 & 0.461 & 0.539 \end{bmatrix}$

$P^6 = \begin{bmatrix} 0.213 & 0.197 & 0.197 \\ 0.311 & 0.326 & 0.280 \\ 0.477 & 0.477 & 0.523 \end{bmatrix}$

$P^7 = \begin{bmatrix} 0.206 & 0.198 & 0.198 \\ 0.308 & 0.316 & 0.288 \\ 0.486 & 0.486 & 0.514 \end{bmatrix}$

$P^8 = \begin{bmatrix} 0.203 & 0.199 & 0.199 \\ 0.305 & 0.309 & 0.292 \\ 0.492 & 0.492 & 0.508 \end{bmatrix}$

Approaches the matrix $\begin{bmatrix} 0.2 & 0.2 & 0.2 \\ 0.3 & 0.3 & 0.3 \\ 0.5 & 0.5 & 0.5 \end{bmatrix}$.

88. False. Matrix multiplication is not commutative.

90. $AC = BC = \begin{bmatrix} 2 & 3 \\ 2 & 3 \end{bmatrix}$

92. $A^2 = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$, $A^3 = \begin{bmatrix} -i & 0 \\ 0 & -i \end{bmatrix}$, $A^4 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

94. The product is a diagonal matrix whose entries are the products of the corresponding entries of A and B.

96. $\frac{4}{3}, -8$ 98. $\frac{-5 + \sqrt{37}}{4}, \frac{-5 - \sqrt{37}}{4}$

100. $4, \pm\sqrt{\frac{5}{3}}i$ 102. $\ln 100 - 2$

104. $2 \ln x + 3 \ln(x - 2)$ 106. $\ln\left(\frac{64}{\sqrt[3]{x^2 + 3}}\right)$

108. $\ln\left(\frac{\sqrt{x}(x + 5)}{\sqrt{x - 8}}\right)$ 110. $(0, 5, -1)$

Section 8.3 (page 588)

2.-12. Answers will vary. 14. $\begin{bmatrix} 7 & -2 \\ -3 & 1 \end{bmatrix}$

16. $\begin{bmatrix} -19 & -33 \\ -4 & -7 \end{bmatrix}$ 18. Does not exist

20. Does not exist 22. $\begin{bmatrix} -13 & 6 & 4 \\ 12 & -5 & -3 \\ -5 & 2 & 1 \end{bmatrix}$

24. Does not exist

26. $\frac{1}{11}$

30. $\frac{1}{2}$

34. $\frac{1}{4}$

36. $\frac{1}{9}$

40. $\frac{1}{9}$

44. 6

50. -

56. -

62. 10

66. \$0

\$3

68. \$2

\$2

70. I_1

72. Fa

74. An

76. (a)

(b)

78. -1

82. $\begin{bmatrix} x \\ f \end{bmatrix}$

+

26. $\frac{1}{10} \begin{bmatrix} 10 & -15 & -40 & 26 \\ 0 & 5 & 10 & -8 \\ 0 & 0 & -5 & 1 \\ 0 & 0 & 0 & 2 \end{bmatrix}$ 28. $\begin{bmatrix} -10 & -4 & 27 \\ 2 & 1 & -5 \\ -13 & -5 & 35 \end{bmatrix}$

30. $\frac{1}{2} \begin{bmatrix} 2 & -2 & 0 \\ 14 & -17 & 2 \\ -16 & 20 & -2 \end{bmatrix}$ 32. Does not exist

34. $\begin{bmatrix} 3.75 & 0 & -1.25 \\ 3.458 & -1 & -1.375 \\ 4.167 & 0 & -2.5 \end{bmatrix}$

36. $\begin{bmatrix} 27 & -10 & 4 & -29 \\ -16 & 5 & -2 & 18 \\ -17 & 4 & -2 & 20 \\ -7 & 2 & -1 & 8 \end{bmatrix}$ 38. $\begin{bmatrix} -24 & 7 & 1 & -2 \\ -10 & 3 & 0 & -1 \\ -29 & 7 & 3 & -2 \\ 12 & -3 & -1 & 1 \end{bmatrix}$

40. $\frac{1}{9} \begin{bmatrix} -2 & -3 \\ -5 & -12 \end{bmatrix}$ 42. $\frac{1}{143} \begin{bmatrix} -32 & 81 \\ 60 & 9 \end{bmatrix}$

44. (6, 3) 46. (-7, -4) 48. (1, 7, -9)

50. (-32, -13, -37, 15) 52. $(\frac{1}{2}, \frac{1}{3})$ 54. (6, -2)

56. (-12, 10) 58. (5, 8, -2) 60. (-1, 2, 0)

62. (10, -3, 5) 64. (6.21, -0.77, -2.67, 2.40)

66. \$0 in AAA-rated bonds, \$15,000 in A-rated bonds, \$30,000 in B-rated bonds

68. \$200,000 in AAA-rated bonds, \$100,000 in A-rated bonds, \$200,000 in B-rated bonds

70. $I_1 = \frac{5}{7}$ ampere, $I_2 = \frac{10}{7}$ amperes, $I_3 = \frac{15}{7}$ amperes

72. False. The two matrices may not be square.

74. Answers will vary.

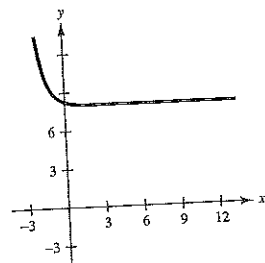
76. (a) Answers will vary.

(b) $A^{-1} = \begin{bmatrix} \frac{1}{a_{11}} & 0 & 0 & 0 & \dots & 0 \\ 0 & \frac{1}{a_{22}} & 0 & 0 & \dots & 0 \\ 0 & 0 & \frac{1}{a_{33}} & 0 & \dots & 0 \\ \vdots & \vdots & \vdots & \vdots & \dots & \vdots \\ 0 & 0 & 0 & 0 & \dots & \frac{1}{a_{nn}} \end{bmatrix}$

78. -1, 4, 6 80. -4, -1, 0, 3

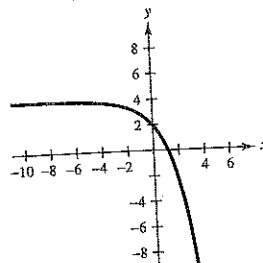
82.

x	-3	-2	-1	0	1	2
f(x)	24	12	9	8.25	8.06	8.02



84.

x	-8	-3	-2	-1	0	1	2	3
f(x)	3.98	3.7	3.4	2.9	2	0.4	-2.6	-8.1



86. $\begin{bmatrix} \frac{1}{2} & -\frac{1}{6} & 0 \\ \frac{1}{3} & 2 & -\frac{3}{2} \end{bmatrix}$ 88. $\begin{bmatrix} 36 & -13 \\ 3 & 8 \end{bmatrix}$

90. $\begin{bmatrix} -32 & 34 & 36 \\ 8 & -15 & 4 \\ 0 & 1 & -2 \end{bmatrix}$

Section 8.4 (page 596)

2. -3 4. -11 6. -12 8. 0 10. 3

12. -5 14. -0.022

16. (a) $M_{11} = 2, M_{12} = -3, M_{21} = 0, M_{22} = 11$

(b) $C_{11} = 2, C_{12} = 3, C_{21} = 0, C_{22} = 11$

18. (a) $M_{11} = 36, M_{12} = -42, M_{13} = 85, M_{21} = -82, M_{22} = -12, M_{23} = -68, M_{31} = 24, M_{32} = -28, M_{33} = -51$

(b) $C_{11} = 36, C_{12} = 42, C_{13} = 85, C_{21} = 82, C_{22} = -12, C_{23} = 68, C_{31} = 24, C_{32} = 28, C_{33} = -51$

20. 151 22. -1167 24. 2 26. -66

28. -108 30. -100 32. -140 34. 240

36. 7441 38. -48

40. (a) 0 (b) -1 (c) $\begin{bmatrix} -2 & -5 \\ 4 & 10 \end{bmatrix}$ (d) 0

42. (a) 0 (b) -7 (c) $\begin{bmatrix} 7 & -4 & 9 \\ 8 & -6 & 3 \\ 6 & -2 & 15 \end{bmatrix}$ (d) 0

44. (a) -46 (b) 89 (c) $\begin{bmatrix} 53 & -10 & 10 & 22 \\ -1 & 2 & 5 & 1 \\ -29 & 18 & -6 & -13 \\ 35 & 16 & -1 & 12 \end{bmatrix}$

(d) -4094

46.-50. Answers will vary. 52. -1, 3 54. $3x^2 + 3y^2$

56. e^{-2x} 58. x 60. True

62. 0. Answers will vary.