

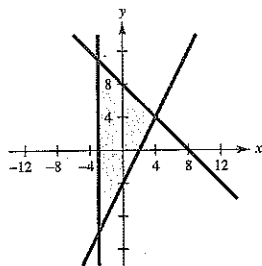
64. Yes. $|2A| = 8|A| = 8(5) = 40$

66. (a) -5 times Row 1 is added to Row 2.

(b) -2 times Row 2 is added to Row 1.

68. $(2, -4)$ 70. $(-\frac{130}{17}, \frac{19}{51})$

72.



74. $\begin{bmatrix} \frac{1}{4} & \frac{1}{4} \\ 2 & 1 \end{bmatrix}$ 76. Does not exist

Section 8.5 (page 607)

2. $\frac{31}{2}$ 4. $\frac{33}{2}$ 6. $\frac{123}{8}$ 8. $\frac{25}{2}$ 10. $x = 19, 3$

12. Not collinear 14. Collinear 16. $x = 3$

18. $(-1, 2)$ 20. $(7, 5)$ 22. $(\frac{8}{5}, -\frac{83}{10})$

24. $(5, 8, -2)$ 26. Cramer's Rule does not apply.

28. 3100 square feet

30. Uncoded: $[16, 12, 5], [1, 19, 5], [0, 19, 5], [14, 4, 0], [13, 15, 14], [5, 25, 0]$

Encoded: $43 \ 6 \ 9 \ -38 \ -45 \ -13 \ -42 \ -47 \ -14$
 $44 \ 16 \ 10 \ 49 \ 9 \ 12 \ -55 \ -65 \ -20$

32. $13 \ 19 \ 10 \ -1 \ -33 \ -77 \ 3 \ -2 \ -14 \ 4 \ 1 \ -9 \ -5$
 $-25 \ -47 \ 4 \ 1 \ -9$

34. $58 \ 122 \ 139 \ 1 \ -37 \ -95 \ 40 \ 67 \ 55 \ 23 \ 17 \ -19 \ 47$
 $88 \ 88 \ 65 \ 140 \ 164$

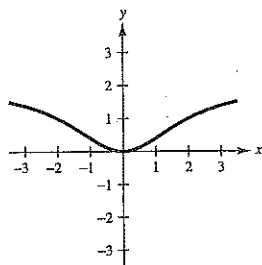
36. BRONCOS WIN SUPER BOWL

38. RETURN AT DAWN 40. CANCEL ORDERS SUE

42. False. It could have infinitely many solutions.

44. $x + 4y - 19 = 0$ 46. $2x - 7y - 27 = 0$

48. 50. $(-1, 0, -3)$



Review Exercises (page 610)

2. 2×4 4. 1×5 6. 2×3

8. $\begin{bmatrix} -1 & 1 & \vdots & 12 \\ 10 & -4 & \vdots & -90 \end{bmatrix}$

10. $\begin{bmatrix} 3 & -5 & 1 & \vdots & 25 \\ -4 & 0 & -2 & \vdots & -14 \\ 6 & 1 & 0 & \vdots & 15 \end{bmatrix}$

12. $\begin{cases} 13x + 16y + 7z + 3w = 2 \\ x + 21y + 8z + 5w = 12 \\ 4x + 10y - 4z + 3w = -1 \end{cases}$

14. $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

16. $\begin{bmatrix} 1 & 0 & 0 & -6 & -4 & 3 \\ 0 & 1 & 0 & 11 & 6 & -5 \\ 0 & 0 & 1 & -2 & -1 & 1 \end{bmatrix}$ 18. $\begin{bmatrix} 1 & 0 & \frac{8}{7} \\ 0 & 1 & \frac{10}{7} \\ 0 & 0 & 0 \end{bmatrix}$

20. $(-9, -4)$ 22. $(0.6, 0.5)$ 24. Inconsistent

26. Inconsistent 28. $(\frac{31}{42}, \frac{5}{14}, \frac{13}{84})$ 30. $(6, -2, 0)$

32. $(1, 2)$ 34. $(-2, 1, 1)$ 36. Inconsistent

38. $x = 8, y = 0$ 40. $x = 12, y = -2$

42. Not possible. The difference of two matrices of different orders is undefined.

44. $\begin{bmatrix} 54 & 4 \\ -2 & 24 \\ -4 & 32 \end{bmatrix}$ 46. $\begin{bmatrix} -26 & -4 & 8 & 10 \\ 40 & -36 & 58 & -62 \end{bmatrix}$

48. $\begin{bmatrix} 6 & -8 \\ -11 & 54 \\ -44 & 2 \end{bmatrix}$ 50. $\frac{1}{6} \begin{bmatrix} -13 & 6 \\ -2 & -17 \\ 0 & 20 \end{bmatrix}$

52. $\frac{1}{3} \begin{bmatrix} -13 & -10 \\ 12 & -15 \\ -26 & -16 \end{bmatrix}$ 54. Not possible

56. $\begin{bmatrix} 4 & 6 & 3 \\ 0 & 6 & -10 \\ 0 & 0 & 6 \end{bmatrix}$ 58. $\begin{bmatrix} 4 & -3 \\ 82 & -48 \end{bmatrix}$ 60. $\begin{bmatrix} 13 & 24 \\ 20 & 4 \end{bmatrix}$

62. $\begin{bmatrix} 2 & 3 & 1 \\ 2 & -3 & -3 \\ 4 & -2 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 10 \\ 22 \\ -2 \end{bmatrix}$

64. $A_n = \begin{bmatrix} 10,250 & 9250 \\ 8125 & 12,250 \\ 6750 & 6000 \end{bmatrix}$

$BA_n = [\$342,687.50 \quad \$378,937.50]$

66. and 68. Answers will vary. 70. $\begin{bmatrix} 3 & 5 \\ -2 & -3 \end{bmatrix}$

72. $\begin{bmatrix} 1 & 11 & 8 \\ -1 & -7 & -5 \\ -1 & -14 & -10 \end{bmatrix}$ 74. $\frac{1}{46} \begin{bmatrix} 2 & 10 \\ -4 & 3 \end{bmatrix}$

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34.

76. Does not exist 78. $\begin{bmatrix} \frac{3}{2} & -2 \\ -\frac{7}{2} & 5 \end{bmatrix}$
 80. Does not exist 82. $\begin{bmatrix} -\frac{2}{3} & -\frac{5}{8} \\ \frac{1}{5} & -\frac{3}{16} \end{bmatrix}$ 84. (2, -3)

86. (-2, 1) 88. (-2, 4, 3) 90. (-3, 5, 0)

92. (5, 6) 94. (2, -4, 6)

96. No inverse. System is inconsistent.

98. -41 100. 78

102. (a) $M_{11} = -4, M_{12} = 5, M_{21} = 6, M_{22} = 3$

- (b) $C_{11} = -4, C_{12} = -5, C_{21} = -6, C_{22} = 3$

104. (a) $M_{11} = 19, M_{12} = -24, M_{13} = 26, M_{21} = 2,$

- $M_{22} = 32, M_{23} = 20, M_{31} = -47, M_{32} = -96,$

- $M_{33} = 22$

- (b) $C_{11} = 19, C_{12} = 24, C_{13} = 26, C_{21} = -2,$

- $C_{22} = 32, C_{23} = -20, C_{31} = -47, C_{32} = 96,$

- $C_{33} = 22$

106. (a) 650 (b) 650 108. -117 110. 20

112. -255 114. 0 116. 280 118. 24

120. $\frac{25}{8}$ 122. Collinear 124. Collinear

126. (-3, 4) 128. (3, -2) 130. (6, 8, 1)

132. $(\frac{32}{7}, \frac{30}{7})$ 134. $(\frac{3}{4}, \frac{25}{28}, -\frac{73}{28})$

136. 40 liters of 75% solution, 60 liters of 50% solution

138. $y = -x^2 - 4x + 1$ 140. 7680 units

142. Uncoded: [18 5 20], [21 18 14], [0 20 15],
 [0 2 1], [19 5 0]

- Encoded: 66 28 10 -24 -59 -22 -75 -90 -25
 -9 -10 -3 8 -11 -10

144. MAY THE FORCE BE WITH YOU 146. True

Chapter 9

Section 9.1 (page 625)

2. -3, 1, 5, 9, 13 4. $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{32}$

6. $-\frac{1}{2}, \frac{1}{4}, -\frac{1}{8}, \frac{1}{16}, -\frac{1}{32}$ 8. $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}$

10. $2, \frac{14}{9}, \frac{28}{9}, \frac{16}{11}, \frac{24}{11}$ 12. $0, \frac{1}{2}, 0, \frac{1}{4}, 0$

14. $\frac{3}{4}, \frac{9}{16}, \frac{27}{64}, \frac{81}{256}, \frac{243}{1024}$ 16. $10, \frac{10}{\sqrt{4}}, \frac{10}{\sqrt{9}}, \frac{10}{\sqrt{16}}, \frac{10}{\sqrt{25}}$

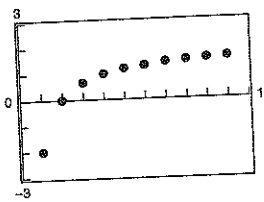
18. $\frac{1}{2}, \frac{1}{2}, \frac{3}{4}, \frac{3}{4}, \frac{15}{4}$ 20. $-\frac{1}{2}, \frac{2}{3}, -\frac{3}{4}, \frac{4}{5}, -\frac{5}{6}$

22. 0, 0, 6, 24, 60 24. -240 26. 2520 28. $\frac{148}{595}$

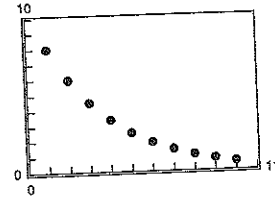
30. 15, 18, 21, 24, 27 32. 32, 16, 8, 4, 2

34. 52, 40, -32, -56, 4

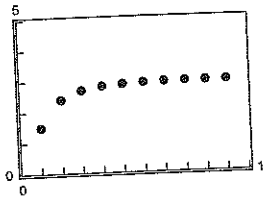
36.



38.



40.



42. 12, 48, 120, 240, 420, 672, 1008, 1440, 1980, 2640

44. $-\frac{1}{9}, -\frac{1}{3}, -6, 4, 8, \frac{360}{13}, \frac{1680}{13}, \frac{2240}{3}, 5111, 40,320$

46. $\frac{4}{3}, 4, \frac{36}{5}, \frac{32}{3}, \frac{100}{7}, 18, \frac{196}{9}, \frac{128}{5}, \frac{324}{11}, \frac{100}{3}$ 48. (b) 50. (a)

52. $a_n = 4n - 1$ 54. $a_n = \frac{1}{n^2}$ 56. $a_n = \frac{n+1}{2n-1}$

58. $a_n = \frac{(-2)^{n-1}}{3^n}$ 60. $a_n = 1 + \frac{2^n - 1}{2^n}$

62. $a_n = \frac{2^{n-1}}{(n-1)!}$ 64. $a_n = (-1)^{n+1}$

66. 25, 20, 15, 10, 5 68. 14, -28, 56, -112, 224

- $a_n = 30 - 5n$ $a_n = 14(-2)^{n-1}$

70. $\frac{210}{1}$ 72. 600 74. 1260 76. $(n+2)(n+1)$

78. $(2n+2)(2n+1)$ 80. 57 82. 30 84. 165

86. $\frac{47}{60}$ 88. 14 90. 11 92. 6.06 94. 0.375

96. $\sum_{i=1}^{15} \frac{5}{1+i} = 11.904$ 98. $\sum_{k=1}^6 \left[1 - \left(\frac{k}{6}\right)^2 \right] = 3.472$

100. $\sum_{n=0}^7 \left(-\frac{1}{2}\right)^n = 0.664$ 102. $\sum_{k=1}^{10} \frac{1}{k(k+2)} = 0.663$

104. $\sum_{k=1}^6 \frac{k!}{2^k} = 18.25$ 106. $\frac{242}{243}$ 108. $-\frac{51}{32}$

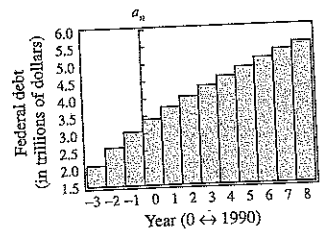
110. $\frac{4}{9}$ 112. $\frac{2}{9}$

114. (a) $A_1 = \$101.00, A_2 = \$203.01, A_3 = \$306.04,$

- $A_4 = \$410.10, A_5 = \$515.20, A_6 = \$621.35$

- (b) $A_{60} = \$8248.64$ (c) $A_{240} = \$99,914.79$

116.



According to the graph, federal debt increases every year.