

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

$$28. \begin{bmatrix} -10 & -4 & 27 \\ 2 & 1 & -5 \\ -13 & -5 & 35 \end{bmatrix}$$

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

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

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

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

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

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

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

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

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.

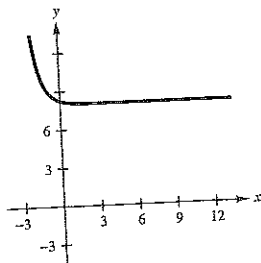
74. Answers will vary.

76. (a) Answers will vary.

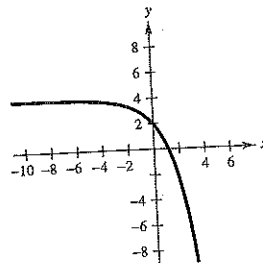
$$(b) A^{-1} = \begin{bmatrix} \frac{1}{a_{11}} & 0 & 0 & 0 & \dots & 0 \\ 0 & \frac{1}{a_{22}} & 0 & 0 & \dots & 0 \\ 0 & 0 & \frac{1}{a_{33}} & 0 & \dots & 0 \\ \vdots & \vdots & \vdots & \vdots & \dots & \vdots \\ 0 & 0 & 0 & 0 & \dots & \frac{1}{a_{nn}} \end{bmatrix}$$

$$78. -1, 4, 6 \quad 80. -4, -1, 0, 3$$

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



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

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

### Section 8.4 (page 596)

$$2. -3 \quad 4. -11 \quad 6. -12 \quad 8. 0 \quad 10. 3$$

$$12. -5 \quad 14. -0.022$$

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

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

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

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

$$20. 151 \quad 22. -1167 \quad 24. 2 \quad 26. -66$$

$$28. -108 \quad 30. -100 \quad 32. -140 \quad 34. 240$$

$$36. 7441 \quad 38. -48$$

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

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

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

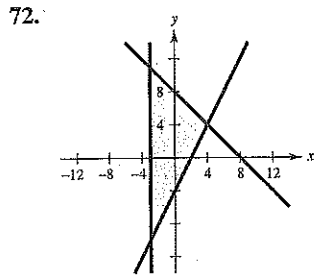
$$(d) -4094$$

$$46.-50. \text{ Answers will vary.} \quad 52. -1, 3 \quad 54. 3x^2 + 3y^2$$

$$56. e^{-2x} \quad 58. x \quad 60. \text{ True}$$

$$62. 0. \text{ Answers will vary.}$$

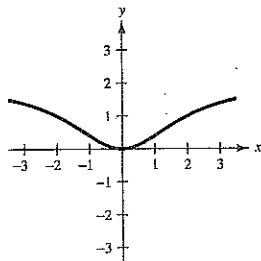
64. Yes.  $|2A| = 8|A| = 8(5) = 40$   
 66. (a)  $-5$  times Row 1 is added to Row 2.  
 (b)  $-2$  times Row 2 is added to Row 1.  
 68.  $(2, -4)$  70.  $(-\frac{130}{17}, \frac{19}{51})$



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.  $2 \times 4$  4.  $1 \times 5$  6.  $2 \times 3$

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.  $\frac{1}{48} \begin{bmatrix} 2 & 10 \\ -4 & 3 \end{bmatrix}$

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