Linear Algebra 3.1 Homework

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3. $2(4) - 1(3) = 5$

5. $5(3) + 12 = 27$

11. $(\lambda - 3)(\lambda - 1) - 4(2) = \lambda^2 - 4\lambda - 5$

13.
   (a) $M_{11} = 4$
   (b) $M_{12} = 3$
   (c) $M_{21} = 2$
   (d) $M_{22} = 1$

   (a) $C_{11} = 4$
   (b) $C_{12} = -3$
   (c) $C_{21} = -2$
   (d) $C_{22} = 1$

15.
   (a) $M_{11} = 23$
   (b) $M_{12} = -8$
   (c) $M_{13} = -22$
   (d) $M_{21} = 5$
   (e) $M_{22} = -5$
   (f) $M_{23} = 5$
   (g) $M_{31} = 7$
   (h) $M_{32} = -22$
   (i) $M_{33} = -23$

   (a) $C_{11} = 23$
   (b) $C_{12} = 8$
   (c) $C_{13} = -22$
   (d) $C_{21} = -5$
   (e) $C_{22} = -5$
   (f) $C_{23} = -5$
   (g) $C_{31} = 7$
   (h) $C_{32} = 22$
   (i) $C_{33} = -23$

17.
   (a) $4(-5) + 5(-5) + 6(-5) = -75$
   (b) $2(8) + 5(-5) - 3(22) = -75$

19. About Row 2: $3[-1(3(4) - 4(-2))] + 2(1) = -58$

25. About Row 2: $3[-1(y + 1)] + 2(x + 1) = -3y + 2x - 1$

27. About Column 1: $5[6(2) + 12(-1)] + 4[3(2) + 6(-1)] = 0$

29. About Row 1:

(a) $w\{-15[32(17)] - 24[-840 - 396] + 30[32(46)]\}$

(b) $-x\{21[32(17)] - 24[350 + 40(18)] + 30[-32(50)]\}$

(c) $y\{21[-840 - 396] + 15[350 + 40(18)] + 30[-220 + 40(24)]\}$

(d) $-z\{21[32(46)] + 15[-32(50)] + 24[-220 + 24(40)]\}$

$$= 65,664w + 62,256x + 12,294 - 24,672z$$

41. About Column 1: $5[0(-2) - 6(0(2) + 0(1)) + 0(2)] = 0$

43. (a) False:

$$\begin{vmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{vmatrix} = a_{11}a_{22} - a_{12}a_{21}$$

(b) True. In such a case, the only possible way to find a determinant is if it equals the first (and only) entry.

(c) False. That is the definition of a minor. A cofactor could either be equal to the statement, or the negative version of the statement.

44.

45.

51.

63.

64.

65.

67.