Solutions Book Chapter 8, SCI 113 Spring 2008

(1) **Exercise 8.1** (b) 0, (c) 1, (d) -1, (f) 6.

(2) **Exercise 8.2** (a) Row 2 is a multiple of row 1, (b) column 2 is the sum of column 1 and column 3. In other words, if you change column 3 by adding to it column 1, then you get a matrix with two identical columns, hence the determinant must be zero. (c) Row 3 is the difference of row 1 and row 2. (d) Column 2 and column 3 are identical.

(3) **Exercise 8.3** $a^2 c\Delta$.

(4) **Exercise 8.4** (a) 1192, (b) 1728, (c) -22, (d) -8132.

(5) **Exercise 8.5** Expand in the first column to get $\Delta = (b-c)(a-b)(c-a)$.

(6) **Exercise 8.7** The equation of the line passing through (a_1, b_1) and (a_2, b_2) is given by
$$y - b_1 = \frac{b_1 - b_2}{a_1 - a_2}(x - a_1),$$
equivalently $y = \dfrac{b_1 - b_2}{a_1 - a_2} x + \dfrac{a_1 b_2 - a_2 b_1}{a_1 - a_2}$. If you expand the determinant in the third column and set it equal to zero (and simplify), you will get the above equation. Finally, (a) $-4x + y + 5 = 0$ and (b) $x + 5y + 1 = 0$.

(7) **Exercise 8.8** $a = 7$.