Supplemental problems: §2.2, §2.3

1. Put an augmented matrix into reduced row echelon form to solve the system
$$x_1 - 2x_2 - 9x_3 + \quad x_4 = 3$$
$$4x_2 + 8x_3 - 24x_4 = 4$$

2. We can use linear algebra to find a polynomial that fits given data, in the same way that we found a circle through three specified points in the §2.1 WeBWorK.

   Is there a degree-three polynomial $P(x)$ whose graph passes through the points $(-2, 6), (-1, 4), (1, 6),$ and $(2, 22)$? If so, how many degree-three polynomials have a graph through those four points? We answer this question in steps below.

   a) If $P(x) = a_0 + a_1 x + a_2 x^2 + a_3 x^3$ is a degree-three polynomial passing through the four points listed above, then $P(-2) = 6,$ $P(-1) = 4,$ $P(1) = 6,$ and $P(2) = 22$. Write a system of four equations which we would solve to find a_0, a_1, a_2, and a_3.

   b) Write the augmented matrix to represent this system and put it into reduced row-echelon form. Is the system consistent? How many solutions does it have?