1. $C = A * x + 124$ where A is the cost per item.

   $228 = A * 160 + 124$
   $104 = A * 160$
   $A = 0.65$

   Answer: $C = 0.65x + 124$

2. (a) points $(6, 600)$ and $(10, 150)$
   Answer: $y - 600 = -112.5(x - 6)$ or $y = -112.5x + 1275$

   (b) find y when x=0.
   Answer: 1275

3. Answer:
$$\left[\begin{array}{ccc|c} 0 & 21 & 3 & 11 \\ 2 & 3 & 1 & 3 \\ 4 & 2 & 0 & 14 \end{array}\right]$$

4. (a) Profit = Rev - Cost
   $P = A*x-(2x+840)$ where A is the selling price of the sandwich.
   $360 = A * 200 - (2 * 200 + 840)$
   $A = 8$
   Answer: \$8

   (b) solve $8x = 2x + 840$
   Answer: 140 sandwiches

5. use rref.

   Answer: x=2, y=5, and z=0

6. (a) $x = 9$, $y = 5$, and $z = 2$

   (b) no solution

   (c) $x = 2 - 5y + w$
   $z = 3 - 7w$
   y, w =any number

7. use rref.

   DVD Players: 40

   price: 130

8. (a) not possible

   (b) not possible

   (c) not possible

   (d) $\left[\begin{array}{ccc} \text{B} & 5 & 10 \\ 3 & 1 & 3 \end{array}\right]$

   (e) $\left[\begin{array}{cc} 16 & 5 \\ 0 & 11 \end{array}\right]$

9. points are in the form (x, p)

   $(700, 40)$ and $(750, 60)$

10. Combine the matrices on the left side and you get this:
$$\left[\begin{array}{cc} \text{3x-28} & \text{2y-4z} \\ \text{21-4w} & \text{z-8} \end{array}\right] = \left[\begin{array}{cc} 8 & 6 \\ 5 & 2 \end{array}\right]$$
    since the matrices are equal, the corresponding enteries are equal. i.e.

    $3x - 28 = 8$
    $2y - 4z = 6$
    $21 - 4w = 5$
    $z - 8 = 2$

    now solve for the variables.

    Answer: $x = 12$, $y = 23$, $z = 10$, and $w = 4$

11. x = the number to type I cakes made.
    y = the number to type II cakes made.
    z = the number to type III cakes made.

    Objective function:
    $P = 5x + 3y + 2z$

    Constraints:
    $2x + 4y + 2z \leq 280$
    $2x + y + 3z \leq 230$
    $y \geq 3(x + z)$
    $x, y, z \geq 0$

12. $y + 700 = x + 500$
    $z + 500 = 400 + y$
    $300 + x = z + 600$

13. use rref to get this matrix.
$$\left[\begin{array}{ccc|c} 1 & 0 & -1 & -40 \\ 0 & 1 & 2 & 330 \end{array}\right]$$
    From this we know the parametric solution is

    $x = z - 40$ $y = 330 - 2z$ z =any number.

    restrictions on Z: Z = 40, 41, 42, ..., 165

Check the back of the page for more problems.