Week in Review, Sections 1.3-1.4

1. (a) Find the slope of the line passing through the points (1, 4) and (−2, 6).

(b) If $y$ decreases 3 units, what is the corresponding change in $x$?

2. Find equations for the horizontal and vertical lines through (−4, 3)

3. Find the intersection of the lines $2x + 3y = 5$ and $y = 4x − 1$.

4. A manufacturer finds that the number of the production cost is a linear function of the number of units produced.

   (a) If it costs $2300 to produce 10 units and $2450 to produce 15 units, what does it cost to produce 20 units?
(b) What is the fixed cost?

5. At the Dixie Chicken restaurant it is expected that 600 Freddy Hamburgers will be sold at a price of $7 each. For each $0.20 reduction in price, 30 more hamburgers will be sold. The restaurant is willing to supply 525 hamburgers at $4 each, and 825 hamburgers at $8 each.

(a) Find the linear demand equation of the Freddy Hamburger.

(b) Find the linear supply equation of the Freddy Hamburger.

(c) Find the equilibrium price and quantity of the Freddy Hamburger.
6. A firm has a fixed monthly cost of $12,000 and a cost of $15,000 when 150 units are produced, and its products are sold at $35 per unit.

(a) Find the profit function of the production.

(b) Find the break-even point of the production.

7. A piece of furniture is purchased for $2,500. Its value after 5 years is $600. Find the depreciation rate and the straight line equation of the furniture value as a function of time.
The quantity demanded of a certain brand of DVD player is 3000 per week when the unit price is $485. For each decrease in unit price of $20 below $485, the quantity demanded increases by 250 units. The suppliers will not market any DVD players if the unit price is $300 or lower. But at a unit price of $525, they are willing to make available 2500 units in the market. The supply equation is also known to be linear.

(a) Find the demand equation.

(b) Find the supply equation.

(c) Find the equilibrium quantity and price.
9. A new building that costs $1,300,000 has a useful life of 100 years and a scrap value of $500,000. Using straight-line depreciation, find the equation for the value \( V \) in terms of \( t \), where \( t \) is in years. Find the value after 1 year, after 2 years, and after 90 years.

10. Little Ags, Inc. produces miniature yell leader outfits for kids. Their factory has a monthly fixed cost of $8,000 and sells the outfits for $59 each. If it costs the company 25% of the selling price to produce each outfit, determine the linear cost, revenue, and profit functions. How many outfits must the company sell to make a monthly profit of $2,000?