

Math 141 Week-in-Review 1 Problem Set

1. Find the equation of the line that passes through the point $(1, -2)$ and
 - (a) the point $(5, 6)$.
 - (b) has a slope of 0.
 - (c) is parallel to the line $y = -7x + 8$.
 - (d) is parallel to the y -axis.

2. Find the equation of the line that crosses the x -axis at 4 and the y -axis at -3 .

3. Find the equation of the line that is perpendicular to the line $6x - 2y = 12$ and passes through the x -intercept of this line.

4. Line 1 passes through the points $(1, a)$ and $(3, 5)$. Line 2 passes through the points $(2, -2)$ and $(a - 1, -4)$. Find the value of a that makes these lines perpendicular.

5. Benjamin bought a car for \$17,500. After 4 years the car has a book value of \$8,500.
 - (a) Assuming a linear relationship, what is the rate of depreciation?
 - (b) Find a formula for the book value of the car after t years.
 - (c) When will the car be worth \$6,250?
 - (d) If the car is to be depreciated over its useful life of 7 years, what is the scrap value of the car?

6. A cell phone company has fixed costs of \$5,000 each month. It costs this company \$8 to make each phone and each phone sells for \$19.
 - (a) Find the cost, revenue, and profit functions for this company.
 - (b) How many phones need to be sold in a month in order to have a profit of \$31,300?

7. A DVD company incurs \$3,000 in fixed costs each month and production costs of \$8 per DVD. The company earns a profit of \$4,200 when they sell 600 DVDs in a month.
 - (a) What is the selling price of a DVD?
 - (b) What is the profit function for this company?

8. A CD company pays \$4,500 in fixed costs each month. The production of 60 CDs in a month incurs a total cost of \$5,220. Each CD is sold for \$16.
 - (a) What is the production cost per CD?
 - (b) What are the cost, revenue, and profit functions for this CD company?
 - (c) What is the break-even point for this company?

9. A certain candy company found that when the unit price for a bag of candy is \$4, then the quantity demanded is 12,000. When the unit price increases by \$2, then 3000 fewer bags of candy are demanded.
- (a) Find the demand equation (assuming that it is linear).
 - (b) How many bags of candy will be demanded at a unit price of \$3?
 - (c) At what price will no bags be demanded?
10. Suppose you are given a demand equation of $8p + 10x = 80$ where x is the quantity demanded at a unit price of p dollars, and a supply equation of $12p - x = 24$ where x is the quantity supplied at a unit price of p dollars. What is the market equilibrium?
11. An office goods store found that they can sell 90 pens per week if they cost \$1, but if they increase the price by \$1, then only 30 pens are sold. However the suppliers are only willing to supply 60 pens when the unit price is \$2, and will not supply any pens if the unit price is \$1 or below.
- (a) Find the supply and demand equations (assuming they are linear).
 - (b) Find the market equilibrium.