1.5.1: More Applications (Exercises)

SECTION 1.5 PROBLEM SET: MORE APPLICATIONS

Solve the following problems.

1) Solve for x and y. $y = 3x + 4$ $y = 5x - 2$	2) Solve for x and y. $2x - 3y = 4$ $3x - 4y = 5$
3) The supply and demand curves for a product are: Supply $y = 2000x - 6500$ Demand $y = - 1000x + 28000$, where x is price and y is the number of items. At what price will supply equal demand and how many items will be produced at that price?	4) The supply and demand curves for a product are Supply $y = 300x - 18000$ and Demand $y = - 100x + 14000$, where x is price and y is the number of items. At what price will supply equal demand, and how many items will be produced at that price?
5) A car rental company offers two plans for one way rentals. Plan I charges \$36 per day and 17 cents per mile. Plan II charges \$24 per day and 25 cents per mile. a. If you were to drive 300 miles in a day, which plan is better? b. For what mileage are both rates equal?	

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Solve the following problems.

6) A demand curve for a product is the number of items the consumer will buy at different prices. At a price of \$2 a store can sell 2400 of a particular type of toy truck. At a price of \$8 the store can sell 600 such trucks. If x represents the price of trucks and y the number of items sold, write an equation for the demand curve.	7) A supply curve for a product is the number of items that can be made available at different prices. A manufacturer of toy trucks can supply 2000 trucks if they are sold for \$8 each; it can supply only 400 trucks if they are sold for \$4 each. If x is the price and y the number of items, write an equation for the supply curve.
8) The equilibrium price is the price where the supply equals the demand. From the demand and supply curves obtained in the previous two problems, find the equilibrium price, and determine the number of items that can be sold at that price.	9) A break-even point is the intersection of the cost function and the revenue function, that is, where total cost equals revenue, and profit is zero. Mrs. Jones Cookies Store's cost and revenue, in dollars, for x number of cookies is given by $C = .05x + 3000$ and $R = .80x$. Find the number of cookies that must be sold to break even.

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Solve the following problems.

10) A company's revenue and cost in dollars are given by $R = 225x$ and $C = 75x + 6000$, where x is the number of items. Find the number of items that must be produced to break-even.	11) A firm producing socks has a fixed cost of \$20,000 and variable cost of \$2 per pair of socks. Let x = the number of pairs of socks. Find the break-even point if the socks sell for \$4.50 per pair.

12) Whackemhard Sports is planning to introduce a new line of tennis rackets. The fixed costs for the new line are $25,000 and the variable cost of producing each racket is $60. x is the number of rackets; y is in dollars. If the racket sells for $80, how many rackets must be sold in order to break even?	13) It costs $1,200 to produce 50 pounds of a chemical and it costs $2,200 to produce 150 pounds. The chemical sells for $15 per pound x is the amount of chemical; y is in dollars. a. Find the cost function. b. What is the fixed cost? c. How many pounds must be sold to break even? d. Find the cost and revenue at the break-even point.