

1.6: Chapter Review

SECTION 1.6 PROBLEM SET: CHAPTER REVIEW

- 1) Find an equation of the x-axis.
- 2) Find the slope of the line whose equation is $2x + 3y = 6$.
- 3) Find the slope of the line whose equation is $y = -3x + 5$.
- 4) Find both the x and y intercepts of the line $3x - 2y = 12$.
- 5) Find an equation of the line whose slope is 3 and y-intercept 5.
- 6) Find an equation of the line whose x-intercept is 2 and y-intercept 3.
- 7) Find an equation of the line that has slope 3 and passes through the point (2, 15).
- 8) Find an equation of the line that has slope $-3/2$ and passes through the point (4, 3).
- 9) Find an equation of the line that passes through the points (0, 32) and (100, 212).
- 10) Find an equation of the line that passes through the point (2, 5) and is parallel to the line $y = 3x + 4$.
- 11) Find the point of intersection of the lines $2x - 3y = 9$ and $3x + 4y = 5$.
- 12) Is the point (3, -2) on the line $5x - 2y = 11$?
- 13) Find two points on the line given by the parametric equations, $x = 2 + 3t$, $y = 1 - 2t$.
- 14) Find two points on the line $2x - 6 = 0$.
- 15) Graph the line $2x - 3y + 6 = 0$.
- 16) Graph the line $y = -2x + 3$.
- 17) A female college student who is 60 inches tall weighs 100 pounds. Another female student who is 66 inches tall weighs 124 pounds. Assume the relationship between the female students' weights and heights is linear. Find an equation for weight as a function of height. Use this relationship to predict the weight of a female student who is 70 inches tall.
- 18) In deep-sea diving, the pressure exerted by water plays a great role in designing underwater equipment. If at a depth of 10 feet there is a pressure of 21 lb/in², and at a depth of 50 ft there is a pressure of 75 lb/in², write a linear equation giving a relationship between depth and pressure. Use this relationship to predict pressure at a depth of 100 ft.
- 19) The variable cost to manufacture an item is \$30 per item; the fixed costs are \$2750. Find the cost function.
- 20) The variable cost to manufacture an item is \$10 per item, and it costs \$2,500 to produce 100 items. Write the cost function, and use this function to estimate the cost of manufacturing 300 items.
- 21) It costs \$2,700 to manufacture 100 items of a product, and \$4,200 to manufacture 200 items.
 x = the number of items; y = cost. Find the cost function; use it to predict the cost to produce 1000 items.
- 22) In 1990, the average house in Emerald City cost \$280,000 and in 2007 the same house cost \$365,000. Assuming a linear relationship, write an equation that will give the price of the house in any year, and use this equation to predict the price of a similar house in the year 2020.
- 23) The population of Mexico in 1995 was 95.4 million and in 2010 it was 117.9 million. Assuming a linear relationship, write an equation that will give the population of Mexico in any year, and use this equation to predict the population of Mexico in the year 2025.

SECTION 1.6 PROBLEM SET: CHAPTER REVIEW Word Problems

- 24) At Nuts for Soup Lunch Bar, they sell 150 bowls of soup if the high temperature for the day is 40 °F. For every 5 °F increase in high temperature for the day, they sell 10 fewer bowls of soup.
 - a. Assuming a linear relationship, write an equation that will give y = the number of bowls of soup sold as a function of x = the daily high temperature.
 - b. How many bowls of soup are sold when the temperature is 75 °F?

- c. What is the temperature when 100 bowls of soup are sold?
- 25) Two hundred items are demanded at a price of \$5, and 300 items are demanded at a price of \$3. If x represents the price, and y the number of items, write the demand function.
- 26) A supply curve for a product is the number of items of the product that can be made available at different prices. A doll manufacturer can supply 2000 dolls if the dolls are sold for \$30 each, but he can supply only 400 dolls if the dolls are sold for \$10 each. If x represents the price of dolls and y the number of items, write an equation for the supply curve.
- 27) Suppose you are trying to decide on a price for your latest creation - a coffee mug that never tips. Through a survey, you have determined that at a price of \$2, you can sell 2100 mugs, but at a price of \$12 you can only sell 100 mugs. Furthermore, your supplier can supply you 3100 mugs if you charge your customers \$12, but only 100 mugs if you charge \$2. What price should you charge so that the supply equals demand, and at that price how many coffee mugs will you be able to sell?
- 28) A car rental company offers two plans. Plan I charges \$16 a day and 25 cents a mile, while Plan II charges \$45 a day but no charge for miles. If you were to drive 200 miles in a day, which plan is better? For what mileage are both rates the same?
- 29) The supply curve for a product is $y = 250x - 1000$. The demand curve for the same product is $y = -350x + 8,000$, where x is the price and y the number of items produced. Find the following.
- At a price of \$10, how many items will be in demand?
 - At what price will 4,000 items be supplied?
 - What is the equilibrium price for this product?
 - How many items will be manufactured at the equilibrium price?
- 30) The supply curve for a product is $y = 625x - 600$ and the demand curve for the same product is $y = -125x + 8,400$, where x is the price and y the number of items produced. Find the equilibrium price and determine the number of items that will be produced at that price.
- 31) Both Jenny and Masur work in the sales department for Sports Supply. Jenny gets paid \$120 per day plus 4% commission on the sales. Masur gets paid \$132 per day plus 8% commission on the sales in excess of \$1,000. For what sales amount would they both earn the same daily amounts?
- 32) A company's revenue and cost in dollars are given by $R = 25x$ and $C = 10x + 9,000$, where x represents the number of items. Find the number of items that must be produced to break-even.
- 33) A firm producing a certain type of CFL lightbulb has fixed costs of \$6,800, and a variable cost of \$2.30 per bulb. The bulbs sell for \$4 each. How many bulbs must be produced to break-even?
- 34) A company producing tire pressure gauges has fixed costs of \$7,500, and variable cost of \$1.50 cents per item. If the gauges sell for \$4.50, how many must be produced to break-even?
- 35) A company is introducing a new cordless travel shaver before the Christmas holidays. It hopes to sell 15,000 of these shavers in December. The variable cost is \$11 per item and the fixed costs \$100,000. If the shavers sell for \$19 each, how many must be produced and sold to break-even?

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