Math 140: Week-in-Review 1 (2.1 & 2.2)

1. Find the slope of the line that passes through the points $(-1, 4)$ and $(2, 8)$.

2. Find the equation of the line that passes through the point $(-2, 3)$ and

   (a) has slope $-\frac{1}{2}$

   (b) the slope is undefined

   (c) the slope is 0

   (d) also passes through the point $(1, -2)$.

3. Determine the equation of the line that passes through the point $(-3, 5)$ and is

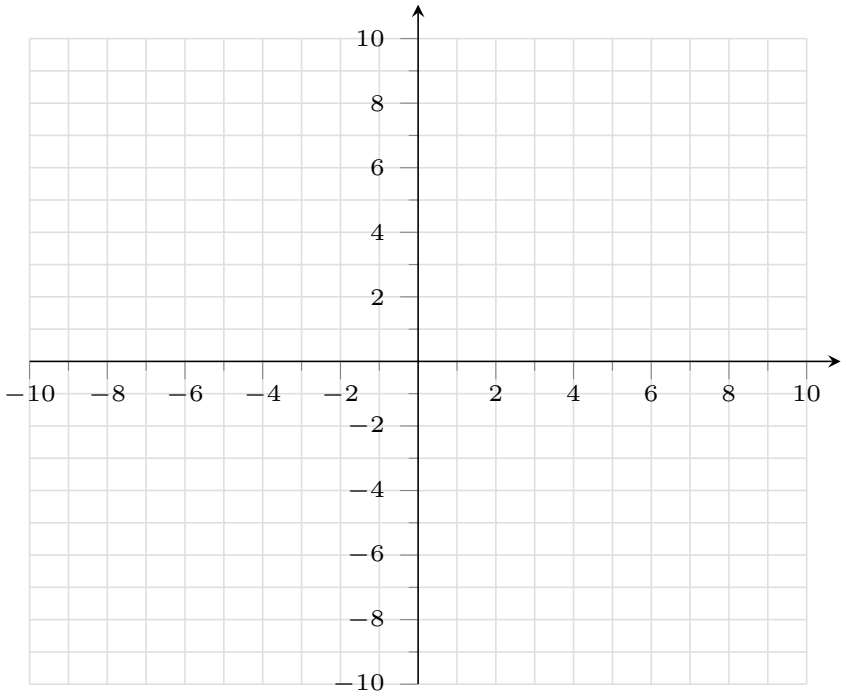
   (a) horizontal

   (b) vertical

4. Determine the equation of the line with slope $\frac{1}{5}$ and x-intercept $(-1/2, 0)$. Leave your answer in standard form.

5. Determine the equation of the line with slope -1 and y-intercept $(0, 5)$. Leave your answer in slope-intercept form.

6. On the grid below, use intercepts to accurately graph the line $7y - 5x = 35$



7. The equation of a line is given in standard form by $3y + 2x = -9$.

   (a) Determine the slope of the line.

   (b) Determine the x-intercept of the line.

   (c) Determine the y-intercept of the line.

   (d) If x increases, does y increase or decrease?

   (e) Suppose x increases by 6 units, what is the corresponding change in y?

   (f) If y decreases by 4 units, what is the corresponding change in x?

8. You buy an electronic gadget for \$3,000. Suppose that the value of the gadget depreciates by the same amount every year until the gadget reaches scrap value. After 5 years, the gadget is worth \$1,750.

   (a) Determine the value $V(t)$ of the electronic gadget, in dollars, after t years.

   (b) Determine the rate of depreciation of the gadget.

   (c) Determine the number of years for the gadget to reach scrap value.

   (d) Determine the value of the gadget after 90 months.

   (e) Determine the value of the gadget after 15 years.

9. A machine purchased in 2015 was worth \$8,000 in 2020. According to the manufacturer, the machine reaches a scrap value of \$1,000 after 12 years of service. Assuming the machine depreciates by the same amount each year,

   (a) What was the purchase price of the machine ?

   (b) Determine the value of the machine in 2028.

10. A company making shoes has fixed costs of \$50,000 each month. The cost of making one pair of shoes is \$15 and each pair of shoes sells for \$70.

    (a) Determine the linear cost, revenue, and profit functions for the shoe company.

    (b) What is the company's profit if 2000 pairs of shoes are made and sold?

    (c) How many shoes need to be sold in order for the company to reach a profit of \$5,000?

11. The total cost of producing 500 items is \$12,500. If no items are produced, \$7,500 is still spent on fixed costs. Each item sells for \$25 dollars.

    (a) What is the production cost for each item?

    (b) Determine the linear cost, revenue, and profit functions.

    (c) How many gadgets need to be sold for the revenue to equal the total costs?

12. A leather belt manufacturer has production costs of \$20 for each belt produced, and incurs \$144,000 in fixed costs each year.

    (a) At the end of the year, the manufacturer has a profit of \$36,000 after selling 6000 belts. What is the selling price of the belts?

    (b) What is the profit function for the company?

13. Suppose x = number of widgets supplied or demanded per month and p = the unit price for each widget (in dollars). Equation 1 is $2p - 3x = 12$ and Equation 2 is $2p + x = 20$

(a) Which of the two equations is the demand equation? Explain.

(b) How many units will consumers demand if the widgets are free?

(c) What is the highest price consumers are willing to pay for the widgets?

(d) Suppliers will only provide the widgets if the price is above what value?

14. If the price per book is \$20, publishers will market 800 books. Consumers will take 9000 books if they were offered for free. If the book price is increased by \$1, consumers will buy 300 less books, while publishers will sell 100 more books.

    (a) Determine the linear supply and demand equations, $p(x)$, where x is the number of books provided or bought at a price of p dollars.

    (b) At what price will 2325 books be supplied?

    (c) How many books will be demanded at a price of \$15 per book?