

MTH 60 Final Review

1. Simplify $[5 - 10(2a - b)] + 7(-a - 1)$.
2. Explain the difference between parts a and b and then simplify each.
 - a. $2 - 4(x + 3)$
 - b. $(2 - 4)(x + 3)$
3. Evaluate each of the following if $m = -2$.
 - a. m^2
 - b. $-m^2$
 - c. $-(m)^2$
4. Use the properties of exponents to simplify the following.
 - a. $x^3 \cdot x^4$
 - b. $(x^4)^3$
 - c. $(5x^3)^2$
- 5a. Solve $\frac{2}{3}p = -1\frac{1}{3}$.
- 5b. Solve $55x - 3(9x + 12) = -64$.
6. Solve $0.5d + 4 = 0.1(5d + 40)$.
7. Solve $3a - 7 = 4 + 3a$.
8. Solve $\frac{9}{2}(x + 3) = 27$.
9. Solve $\frac{1}{3}(2m + t) - a = 7$ for m .
10. The equation $d = 50t$ gives the distance (in miles) that a car will travel in t hours at an average speed of 50 miles per hour. Find the distance traveled for $t = 4$. What is the slope of this equation? What does it mean in practical terms?
11. A new computer sells for \$3000 and depreciates at the rate of \$500 per year for 4 years. Write the value V (in dollars) of the computer as a linear equation of time t in years. Graph the equation over. What is the vertical-intercept? What does it mean in practical terms?
12. What is the slope of the linear equation plotted in Figure 1?

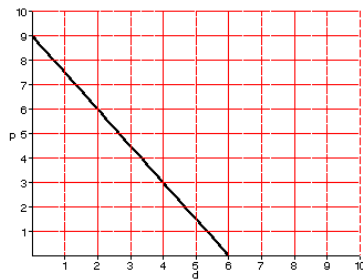


Figure 1

13. Find the equation for each of the lines plotted in Figures 2 through 4.

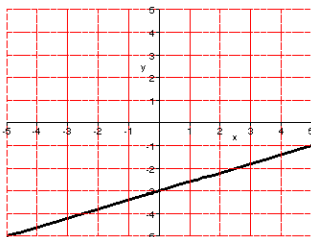


Figure 2

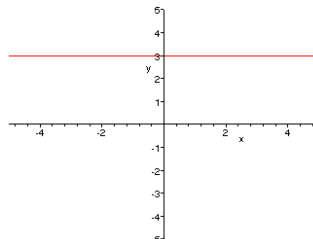


Figure 3

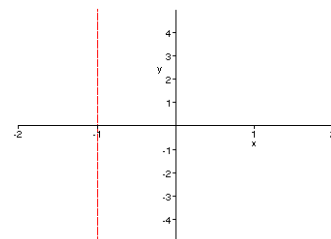


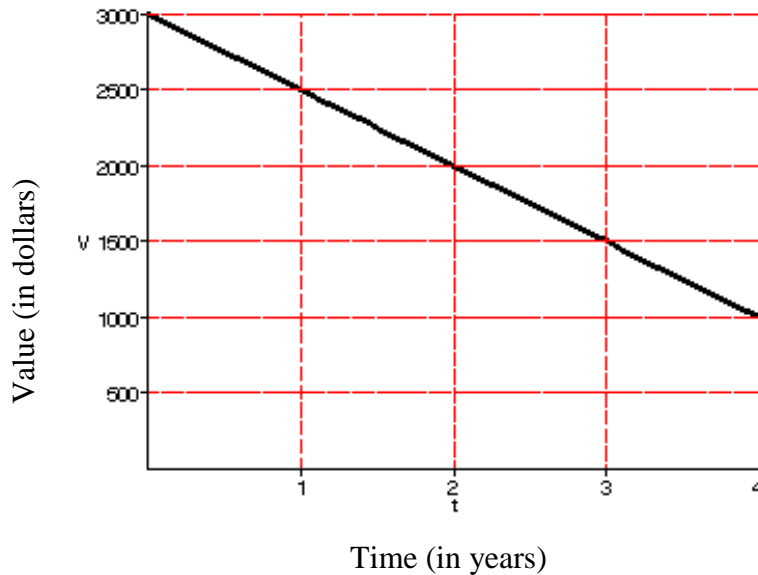
Figure 4

7. There are no solutions. 8. The solution is 3.

9. $m = \frac{21 + 3a - t}{2}$

10. The distance traveled for $t = 4$ is 200 miles. The slope is 50 miles per hour which tells us that the car is traveling at a speed of 50 miles per hour.

11. $V = 3000 - 500t$



The vertical-intercept is (0,3000) which means that the computer originally cost \$3000.

12. The slope is $-\frac{3}{2}$.

13. Figure 2: $y = \frac{2}{5}x - 3$ Figure 3: $y = 3$ Figure 4: $x = -1$

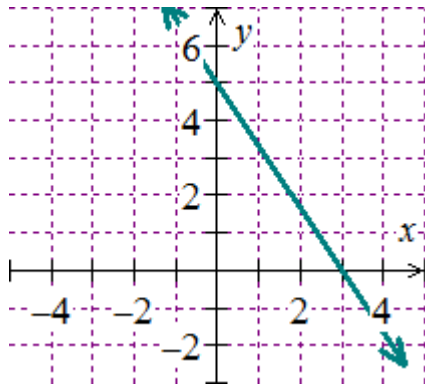
14. $y = \frac{1}{4}x + 5$

15. a. $y = \frac{1}{3}x + 4$ b. $x = 7$ c. $y = 4$

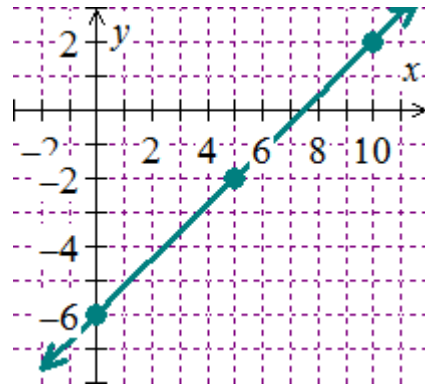
16. The slope of the first model, 0.2 millions of dollars/year, means that the company's profits are increasing by \$200,000 per year. The slope of the second model, 0.3 millions of dollars/year, means that the company's profits are increasing by \$300,000 per year. The second model predicts a faster increase in profits.

17. a. If $m = 76$, then the sales increase at a rate of 76 thousand dollars per year.
b. If $m = 0$, then the sales remain stable.
c. If $m = -14$, then the sales decrease at a rate of 14 thousand dollars per year.

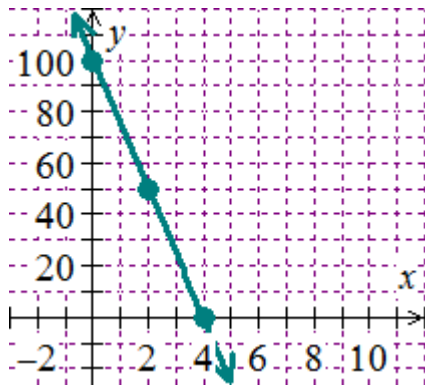
18.



19.



20.



21. a. $R = 4.46t + 33.9$ gives the number of millions of tons of garbage Americans recycle in the year t where $t = 0$ corresponds to 1990. (Your equation may be different depending on how you defined your variables. It is very important to define your variables.)
- b. When $t = 11$, $R = 82.96$ which means that according to my function Americans will recycle 82.96 tons of garbage in 2001.
- c. The horizontal-intercept of my function is approximately $(7.6, 0)$ which means that approximately 7.6 years prior to 1990, or in 1982, Americans did not recycle any garbage. The model does not seem reliable for the year 1982.
- d. The vertical-intercept of my function is $(0, 33.9)$ which means that in 1990 Americans recycled 33.9 million tons of garbage.
- e. The slope of my function is 4.46 millions of tons/year, which means that the amount of garbage that Americans recycle is increasing at a rate of 4.46 million ton per year.
22. a. $P = \frac{3}{100}d + 1$ gives the pressure (measured in atmospheres) at a depth of d feet beneath the ocean's surface.
- b. $P = 21.7$ if $d = 690$ which means that the pressure is 21.7 atm at a depth of 690 feet beneath the ocean's surface.