Chapter 1 Review

1. Write the expression in exponential form.

$$4x \cdot 4x \cdot 4x$$

2. Evaluate the power.

$$2^5$$

3. Evaluate the expression for the given values of the variables.

$$(x+y)^2 \text{ when } x = 5 \text{ and } y = 3$$

4. Evaluate the expression for the given values of the variables.

$$c^3 + d \text{ when } c = 4 \text{ and } d = 16$$

5. Evaluate the expression for the given value of the variable.

$$(8x)^3 \text{ when } x = 2$$

6. Evaluate the expression for the given value of the variable.

$$5y^5 \text{ when } y = 2$$

7. The formula for the volume of a pyramid is 1/3 times the height times the area of the base. The Rain Forest Pyramid in Moody Gardens near Galveston, Texas, is 100 feet high and 200 feet along each side of its square base. What is the volume of the space inside the Rain Forest Pyramid?

8. You invest $80 at a simple annual interest rate of 2%. How much simple interest would you earn in 1.5 years?

9. A 120-pound student playing volleyball burns 2.7 calories per minute. If the student plays for 30 minutes, how many calories does the student burn?

10. Evaluate the expression for the given value of the variable.

$$\frac{9}{10} \cdot y - \frac{3}{10} \text{ when } y = \frac{1}{2}$$

11. Evaluate the expression.
$$5 + 8 \cdot 2 - 4$$

12. Evaluate the expression.
$$10 \div (3 + 2) + 9$$

13. Evaluate the expression .
$$\left[10 + \left(5^2 \cdot 2 \right) \right] \div 6$$

14. Evaluate the expression.
$$2.5 \cdot 0.5^2 \div 5$$

15. Evaluate the expression.
$$\frac{5^3 \cdot 2}{1 + 6^2 - 8}$$

16. You are shopping for school supplies. A store is offering a 10% discount on binders and a 20% discount on packages of paper. You want to buy 5 binders originally marked $2.50 each and 10 packages of paper originally marked at $1.30 each.
    a. Write an expression that shows how much you will save after the discounts.
    b. Evaluate the expression.
    c. If you have $25 to spend on supplies, how much money will you have left over? Explain how you arrived at your answer.

17. Solve the inequality $\dfrac{c + 5}{3} \leq 4$

18. You are playing a new computer game. For every eight screens you complete, you receive a bonus. You want to know how many bonuses you will receive after completing 96 screens. You write the equation $8x = 96$ to model the situation. What do 8, x, and 96 represent in the equation? Solve the equation? Check your solution.

19. Write the mathematical representation of "the product of 16 and x is greater than 32".

20. How long must $1000 be invested at an annual interest rate of 3% to earn $300 in simple interest?

21. Write the verbal sentence as an equation or an inequality
    a. "Twenty-five is the quotient of a number y and 3.5"
    b. "Five decreased by eight is four times y"
    c. "The volume V of a cube with a side length s is less than or equal to thirty minus three"

22. You are running for class president. AT 2:30 on election day you have 95 votes and your opponent has 120 votes. Forty-five more students will be voting. Let x represent the number of students (of the 45) who vote for you.
    a. Write an inequality that shows the values of x that will allow you to win the election.
    b. What is the smallest value of x that is a solution of the inequality?

23. Translate the verbal sentence into an equation.
    "Twelve is the quotient of a number and 3."

24. The table shows the average fuel efficiency for passenger cars for different years. Make a line graph of the data.

Year	1980	1985	1990	1995	1996
Fuel efficiency (miles per gallon)	24.3	27.6	28.0	28.6	28.7

25. Does the table represent a function?
    a.   b.

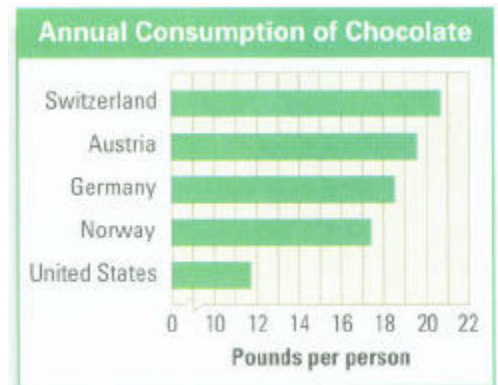| Input	Output
5	3
6	4
7	5
8	6

Input	Output
9	5
9	4
8	3
7	2

26. Make an input-output table for the function $y = 21 - 2x$. Use 0, 1, 2, and 3 as the domain.

27. You start a portable catering business. One of your specialties is a barbecue sandwich plate that costs $.85 to prepare. Suppose you cater an auction where you sell each sandwich plate for $2.00.
   a. Write a function that gives the profit you expect from catering the auction.
   b. You must also spend $50 on equipment and supplies to cater the auction. Write a function that includes this cost.
   c. Use your equation from part **b** to find the profit you will earn if you sell 75 barbecue sandwich plates.
   d. Suppose the cost of sandwich rolls increased by $.05 each. What effect do you think this will have on the profit? Write a function that includes this cost.
   e. Use your equation from part **d** to find how many barbecue sandwich plates you must sell to make a $100 profit.

28. Use the graph to compare the amount of chocolate eaten in different countries
   a. About how much more chocolate per person is consumed in Switzerland than in the United State?
   b. About how much more chocolate per person is consumed in Norway than in the United States?

Annual Consumption of Chocolate

Switzerland
Austria
Germany
Norway
United States

0   10   12   14   16   18   20   22
Pounds per person

▶ Source: Chocolate Manufacturers Association

29. If you place one marble in a measuring cup that contains 200 milliliters of water, the measure on the cup indicates that there is a one millimeter increase in volume. How much does the volume increase when you place from 1 to 10 marbles in the measuring cup?
   a. Write an equation to represent the function.
   b. Complete an input-output table for the function with domain 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.
   c. Describe the domain and range of the function whose values are shown in the table.
   d. Graph the data in the table. Use this graph to graph the function.