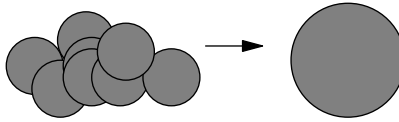# Practice 1

1. _____ Consecutive powers of 2 are arranged in a triangular pattern, as shown. The first row consists of the single entry, 2^1. Each row has one more entry than the row above it. The product of the right-most entries (first three are bolded) of the first six rows can be expressed in the form 2^m for a natural number m. What is the value of m?

$$\mathbf{2^1}$$
$$2^2 \qquad \mathbf{2^3}$$
$$2^4 \qquad 2^5 \qquad \mathbf{2^6}$$
$$\vdots$$

2. _____ The same amount of steel used to create eight solid steel balls, each with a radius of 1 inch, is used to create one larger steel ball. What is the radius of the larger ball?

3. _____ If j is a positive integer and the expression $(7j + 3)$ is multiplied by 3 and then divided by 7, what is the remainder?

4. _____ How many minutes will it take to drive 30 miles at an average rate of 40 miles per hour?

5. _____ What is the least possible denominator of a common fraction that lies strictly between $\frac{1}{3}$ and $\frac{1}{2}$?

6. _____ For the set $\{2, 5, x, 9, 16\}$, written in ascending order, the mean and median are equal. What is the value of x?

7. _____ The mean of the integers 9, x, $2x - 3$, and 7 is 7. Find the value of the smallest integer.

8. _____ A bag contains exactly six balls; two are red and four are green. Sam randomly selects one of the six balls and puts it on the table. Then he randomly selects one of the five remaining balls. What is the probability that the two selected balls are of different colors? Express your answer as a common fraction.

9. _____ A right circular cylinder with radius 2 inches and height 1 inch has the same volume as a second right circular cylinder. The radius of the second cylinder is 1 inch. How many inches are in the height of the second cylinder?

10. _____ What is the sum of the first 100 terms of the arithmetic sequence $3, 11, 19, 27, ...$?