Workout 6

1. _____ The doctor has told Cal O'Ree that during his ten weeks of working out at the gym, he can expect each week's weight loss to be 1% of his weight at the end of the previous week. His weight at the beginning of the workouts is 244 pounds. How many pounds does he expect to weigh at the end of the ten weeks? Express your answer to the nearest whole number.

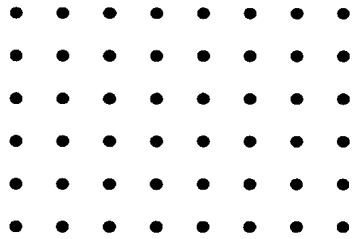
2. _____ The arithmetic mean of x, 50, 53, 21 and 75 is greater than 55 and less than 70. How many possible integer values are there for x?

3. _____ A sphere of radius 2 cm is completely inside a sphere of radius 5 cm. What percent of the volume of the larger sphere is occupied by the volume of the smaller sphere? Express your answer to the nearest tenth.

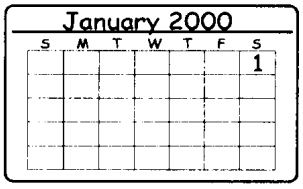
4. _____ A daffodil bulb produces a second bulb every two years. As a result, one bulb becomes two bulbs in two years, four bulbs in four years and eight bulbs in six years.

Mrs. Stover purchased 100 bulbs. Fifty of the bulbs are new and will produce new bulbs for the first time in two years. The other bulbs are one year old and will produce new bulbs for the first time next year. How many years will it be before she has at least 1000 bulbs?

5. _____ A polygon is drawn with its vertices on the points of a lattice. There are six lattice points on the boundary of the polygon and four points in the polygon's interior. How many square units are in the area of the polygon?



6. _____ January 1, 2000 was on a Saturday. On what day of the week was January 1, 1960?



7. _____ A triangle has sides of integer lengths 3, 6 and x. For how many values of x will the triangle be acute?

8. _____ A number is called a *visible factor number* if it is divisible by each of its non-zero digits. For example, 102 is divisible by 1 and 2, so it is a visible factor number. How many visible factor numbers are there from 100 through 150, inclusive?

9. _____ The median of {20, x, 15, 30, 25} is 0.4 less than the mean. If x is a whole number, what is the sum of all possible values of x?

10. _____ The perfect squares from 1 through 1225, inclusive, are printed in a sequence of digits 1491625...1225. How many digits are in the sequence?