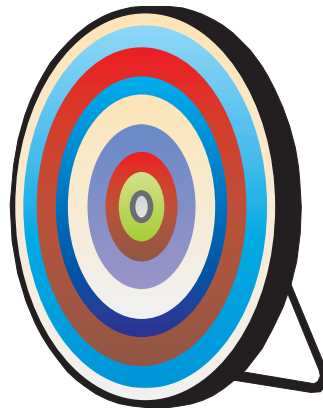


1. Five boys are competing in an archery contest. Each boy has two arrows to shoot into the same circular target. For each shot they can get a whole number of points anywhere from 1 to 10 depending on what part of the target they hit. All 10 shots hit the target in an area with a different value. The final scores were as follows:

Abe: 11 points  
Bert: 4 points  
Colin: 7 points  
Dave: 16 points  
Ernie: 17 points.

Who hit the part of the target worth 6 points?



2. How many subsets of the set  $\{M, A, T, H, C, O, U, R, S, E\}$  contain at least one vowel?

1. \_\_\_\_\_

2. \_\_\_\_\_ subsets

3. Martha has one 6 oz pitcher and one 3 oz pitcher that each contain water. The smaller pitcher is  $\frac{1}{3}$  full and the larger pitcher is  $\frac{2}{3}$  full. Each pitcher is then filled to capacity with oil and the contents of both pitchers are poured into one large container. What fraction of the mixture in the large container is water? Express your answer as a common fraction.

3. \_\_\_\_\_



4. The integer 12 has five one-digit factors, 20 has four one-digit factors, and together 12 and 20 have nine one-digit factors (some of which are repeats.) What is the total number of one-digit factors for all of the integers from 1 to 100, inclusive?

4. \_\_\_\_\_  
one-digit  
factors

5. The mean of the seven numbers  $x$ ,  $2x - 4$ ,  $4x - 3$ ,  $-13$ ,  $9$ ,  $5x + 2$  and  $x - 2$  is 4. What is the integer value of the mode of this set of numbers?

5. \_\_\_\_\_

6. Trapezoid ABCD has base  $AB = 20$  units and base  $CD = 30$  units. Diagonals AC and BD intersect at X. If the area of trapezoid ABCD is 300 square units, what is the area of triangle BXC?

6. \_\_\_\_\_ sq units

7. How many positive four-digit integers contain the digit grouping “73” at least once? For instance, 2738 and 7344 are two such integers to include, but 2378 and 5703 do not meet the restrictions.

7. \_\_\_\_\_ integers

8. A belt is drawn tightly around three circles of radius 10 cm each, as shown. The length of the belt, in cm, can be written in the form  $a + b\pi$ . What is the value of  $a + b$ ?

8. \_\_\_\_\_

