1. In the eight-term sequence $A, B, C, D, E, F, G, H$, the value of $C$ is 5 and the sum of any three consecutive terms is 30 . What is $A+H$ ?
2. Let $R$ be a set of nine distinct integers. Six of the elements are $2,3,4$, 6,9 , and 14 . What is the number of possible values of the median of $R$ ?
3. Set $A$ consists of $m$ consecutive integers whose sum is $2 m$, and set $B$ consists of $2 m$ consecutive integers whose sum is $m$. The absolute value of the difference between the greatest element of $A$ and the greatest element of $B$ is 99 . Find $m$.
4. What is the area of the region bounded by the graphs of $y=|x+2|-|x-2|$ and $y=|x+1|-|x-3|$ ?
5. A dart board is a regular octagon divided into regions as shown. Suppose that a dart thrown at the board is equally likely to land anywhere on the board. What is probability that the dart lands within the center square? Express your answer as a common fraction in simplest radical form.

6. How many positive integers less than 10,000 have at most two different digits?
7. How many different $4 \times 4$ arrays whose entries are all 1's and -1 's have the property that the sum of the entries in each row is 0 and the sum of the entires in each column is 0 ?
8. In triangle $A B C$, we have $A B=A C=20$ and $B C=14$. Consider points $M$ on $\overline{A B}$ and $N$ on $\overline{A C}$. If the minimum value of the sum $B N+M N+M C$ is $x$, compute $100 x$.
9. In the diagram below, how many different routes are there from point $M$ to
point $P$ using only the line segments shown? A route is not allowed to intersect itself, not even at a single point.

10. Three mutually tangent spheres of radius 1 rest on a horizontal plane. A sphere of radius 2 rests on them. What is the distance from the plane to the top of the larger sphere? Express your answer as a common fraction in simplest radical form.
