Washington State Math Championship – 2009
Geometry – 6th
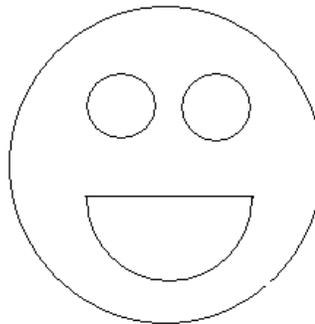
WASHINGTON STATE
MATH CHAMPIONSHIP

$\sqrt{2009}$

BLAINE SCHOOL DISTRICT
ConocoPhillips
Ferndale Refinery

1. Angles *A*, *B,* and *C* are the three angles that make up a scalene triangle. *A* is twice as big as *C,* and *B* is 20 degrees greater than *A*. What is the degree measure of angle *C*?

2. A rectangular prism with a square base has a volume of 144 cubic centimeters. If the height is four centimeters, what is the length of the base in centimeters?

3. If the area of the figure below is 200 square units, what is the perimeter of the figure?
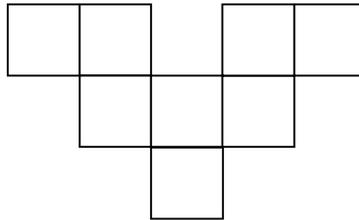
4. A digital (rectangular) picture often measures four inches by six inches. Suppose I wanted to create a frame for a digital picture that extends one inch from each side of the picture. What would the area, in square inches, of *only* the frame be?

5. If the length of each side of a scalene triangle is a prime number and the perimeter is also a prime number, what is the smallest possible perimeter of the triangle?

6. Mr. Smiley, as shown below, is made up of two circular eyes, each with radius one centimeter, and a semicircular mouth with radius three centimeters inside a circular face with radius ten centimeters. To the nearest square centimeter, how much of Mr. Smiley's face is not taken up by his eyes or mouth?

7. A wheel of radius eight inches rolls smoothly down a hill, hitting a rock at the bottom after making 25 complete rotations. To the nearest inch, how many inches is the wheel from the spot where it began rolling to the rock?

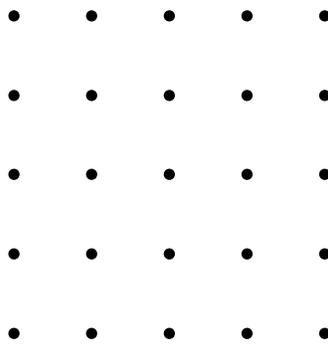**Washington State Math Championship – 2009**
Geometry – 6th

WASHINGTON STATE
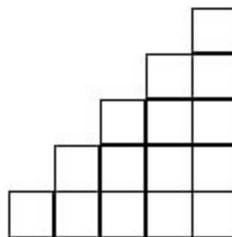MATH CHAMPIONSHIP

√2009

BLAINE SCHOOL DISTRICT
ConocoPhillips
Ferndale Refinery

8. How many uniquely sized squares can be drawn on the geoboard below such that all four vertices of a given square are points on the geoboard?

$$
\begin{matrix}
\bullet & \bullet & \bullet & \bullet & \bullet \\
\bullet & \bullet & \bullet & \bullet & \bullet \\
\bullet & \bullet & \bullet & \bullet & \bullet \\
\bullet & \bullet & \bullet & \bullet & \bullet \\
\bullet & \bullet & \bullet & \bullet & \bullet \\
\end{matrix}
$$

9. In the figure below, how many squares of any size are there?

10. If two vertices of a triangle are located at (0, 0) and (8, 0), what should the coordinates of the third vertex be if we want the area of the triangle to be 8 and the vertex to lie on the line $y = -x + 5$?