GALLOP ROUND RULES

1. The Gallop Round will consist of 24 questions to be solved in 60 minutes.
2. The questions will be divided into 8 sets of 3 questions each, and you **must submit the answers to one set** before accessing the problems for the next. This means you must strategize when to submit each set (incomplete or not) to ensure you get access to as many questions as possible.
3. The problems will get progressively more difficult, and later problems will be worth more points.
4. Submissions will be scored immediately and a live score of all participating teams will be available during the competition. Prepare for the adrenaline rush!

Gallop Set 6 Answer Submission Form

Gallop Live Scores

16.   Jeff makes a square pyramid with 4 layers out of 30 identical cubic blocks as shown below. A cubic block has 6 different colors on its faces. If the number of distinct, visibly different pyramids Jeff can make is N, find the number of factors of N (Note that rotations are not counted as distinct and the bottom face of the pyramid is not visible).
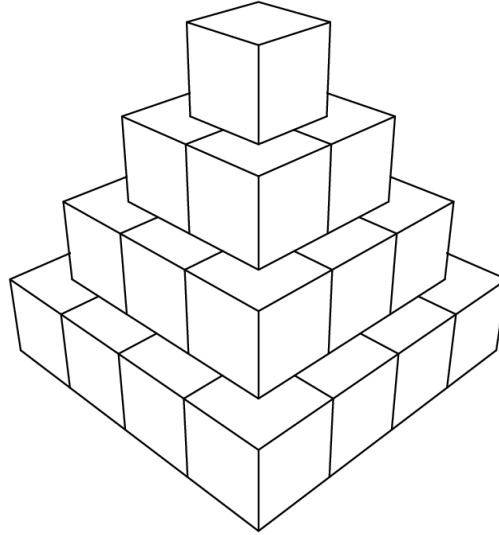
17.   Consider a circle with diameter AB and radius 3. A third point C is on the circle. What is the maximum possible area of the incircle of triangle ABC? The answer can be expressed in simplest form as $\pi \cdot (a + b\sqrt{c})$ for integers a, b, c. What is $a + b + c$?

18.   Gabe is blowing identical bubbles which are made of bubble fluid. A bubble is made of two spheres with the same centers but different radii, with the smaller sphere being hollowed out of the larger sphere. Gabe knows that the thickness of one bubble (the difference between the outer radius and inner radius) is 3 mm, and that the product of the outer and inner radii is 2 mm^2. If the volume of bubble fluid Gabe uses is expressed as $a\pi$ mm^3, what is the value of a?