Geometry Bee Answer Sheet

Welcome to the 6th Annual Geometry Bee! We hope you enjoy these problems. Have fun!

Directions: Do not turn over the paper until your proctor specifically says so. You are allotted 30 minutes to take the exam, which consists of 10 questions.Each of these 10 questions is solvable using standard Euclidean methods, or methods learned throughout a regular Honors Geometry course. You may use rulers, compasses, graph paper, and any other standard mechanical geometry tools. However, **calculators are prohibited**. In general, later problems are intended to be harder than those near the beginning, though there is no such strict ordering.

Answer format: Leave all answers in simplest form. You do not have to show any work; only the numerical answer will be scored. After the contest, you may keep the problem sheet and turn in this answer sheet with all required information filled out to your proctor.

Grading format: Each question will be worth one point. We may look at the distribution of correct answers among each problem to break ties.

Qualification: A student will qualify if he or she receives a sufficient score to place as one of the top scorers on the test. In recent years, around 25 students were admitted into the second round.

Please do not discuss the contents of the test until May 4th.

Name: _____ Grade: _____

Current math class: _____ Teacher: _____

Primary email: _____

1. _____ 2. _____

3. _____ 4. _____

5. _____ 6. _____

7. _____ 8. _____

9. _____ 10. _____

1. Alex walks 100 feet from his house to Blair's house. When he leaves Blair's house, he walks 200 feet to Charlie's house. If Alex always walks the shortest path to his destinations, given only this information, what is the minimum distance, in feet, that he could walk to get home?

2. A dog is chained to the corner of a large rectangular house surrounded by an open yard. If the length of the chain is 10 feet, then what is the area, in square feet, of the region accessible to the dog?

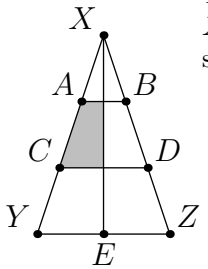
3. What is the length, in cm, of the longest pencil that can fit in a 8cm x 9cm x 12cm box?

4. Humpty Dumpty is a perfect sphere of radius 3. His shell has cracked into equally sized pieces each with area π. (The thickness of the shell is negligible). If each of the king's men takes a different positive number of pieces, what is the greatest number of men the king could have?

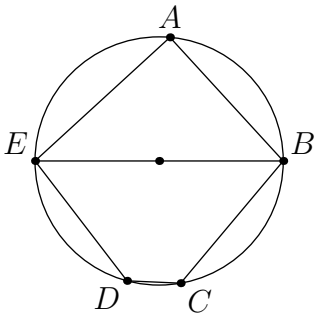
5. The shortest distance from point X to circle O is 8. If a tangent segment from X to circle O has length 20, what is the radius of the circle?

6. Triangle ABC has sides of length x, y, and z, and has angles $x°$, $y°$, and $z°$. What is the area of ABC?

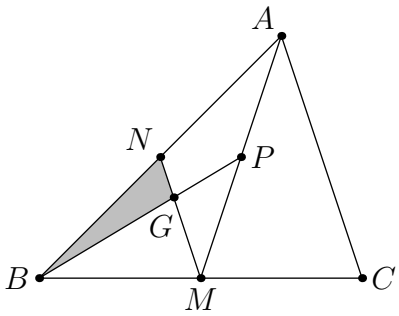
7. The area of triangle XYZ is 72. Points A and C trisect XY. Points B and D trisect XZ. XY and XZ are congruent. Altitude XE bisects YZ. What is the area of the shaded region?



8. In the circle on the right, the diameter EB is parallel to DC, and AB is parallel to ED. The angles AEB and ABE are in the ratio $5 : 13$. What is the measure, in degrees, of angle BCD? (Note: Diagram not drawn to scale.)



9. The area of triangle ABC is 96. Let P be the midpoint of median AM and let N be the midpoint of side AB. If G is the intersection of MN and BP, find the area of triangle NGB.



10. Point N is on hypotenuse YZ of triangle XYZ such that angle $ZXN = 45°$. Given $XZ = 4$ and $XY = 3$, find XN.