



Current Geometry PoW

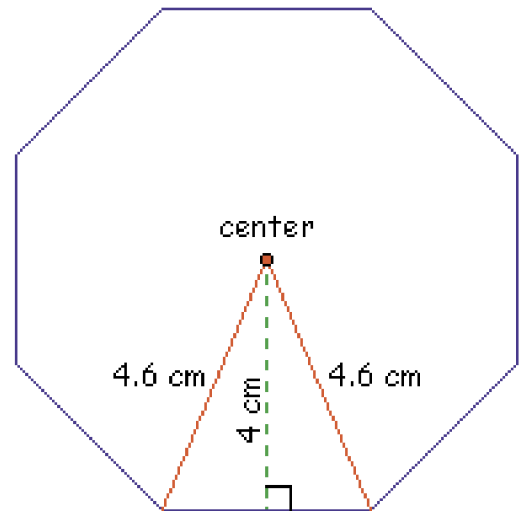
The Math Forum's PoWs provide non-routine constructed response problems. The Geometry problems target concepts typically learned in a high school geometry class. Memberships and mentoring options are available at the individual, class, school, and district levels.

The Perimeter of an Octagon - posted March 24, 2008

Given the regular octagon to the right, answer the following questions:

1. What's wrong with this picture?
2. If you fix what's wrong, what's the perimeter of the octagon?

Extra: Assume that the thing you found to be wrong is actually right. What else could you change to make things right? What's the resulting perimeter of the octagon?



Learn more about the PoWs in Booth 2425 or at http://mathforum.org/problems_puzzles_landing.html

Geometry Problem of the Week Scoring Rubric for *The Perimeter of an Octagon*

For each category, choose the level that *best describes* the student's work

| | Novice | Apprentice | Practitioner | Expert |
|------------------------|--|--|---|--|
| Problem Solving | | | | |
| Interpretation | doesn't seem to understand the goal of the problem thinks there isn't enough information | doesn't point out an inconsistency (might just use the Pythagorean theorem and find the perimeter) points out an inconsistency, but doesn't find the resulting perimeter makes false statements about regular octagons | seems to understand the goal of the problem knows the properties of a regular octagon points out an inconsistency in the given information attempts to find the resulting perimeter | is at least a Practitioner in Strategy and has solved the Extra correctly |
| Strategy | has no ideas that will lead them toward a successful solution | has a strategy that somehow relies on luck | has a strategy that relies on sound reasoning, not luck | considers and fixes all three possible inconsistencies and finds the correct perimeter in each case |
| Accuracy | has made many errors | has made several mistakes or misstatements, or has used vocabulary incorrectly uses trig ratios inappropriately | makes no mistakes of consequence and uses largely correct vocabulary and notation uses trig ratios appropriately | [generally not possible] |
| Communication | | | | |
| Completeness | has written almost nothing that tells you how they found their answer | shows work without explanation, or gives an explanation without showing any work gives results without showing calculations | shows and explains the steps taken and why they are reasonable steps, which might include: <ul style="list-style-type: none"> • how any angles were calculated • what trig ratios were used how and why • how the perimeter was calculated | includes additional helpful information, doesn't just add more for the sake of adding more |
| Clarity | explanation lacks clarity and organization | explanation is difficult to follow length warrants separation into more paragraphs lots of spelling errors/typos | explains the steps that they <i>do</i> explain so that another student would understand (needn't be complete to be clear) makes an effort to check their formatting, spelling, and typing (a few errors are okay) | answer is clearly written and well-organized formats things exceptionally clearly |
| Reflection | <i>The items to the right are considered reflective, and could be in the solution or their comment:</i> does nothing reflective | checks their answer (not the same as viewing our "answer check") reflects on the reasonableness of their answer does one reflective thing | connects the problem to prior knowledge or experience explains where they're stuck summarizes the process they used does two reflective things | comments on and explains the ease or difficulty of the problem revising their answer and improving anything does three or more things or great job with two |