

- 1. Make sense of problems and persevere in solving them.**
- 2. Reason abstractly and quantitatively.**
- 3. Construct viable arguments and critique the reasoning of others.**
- 4. Model with mathematics.**
- 5. Use appropriate tools strategically.**
- 6. Attend to precision.**
- 7. Look for and make use of structure.**
- 8. Look for and express regularity in repeated reasoning.**

## Middle School Problems

A.

You know that the sum of the measures of the interior angles of a triangle (3-gon) is 180 degrees. How might one quickly find the sum of the measures of the interior angles of quadrilateral (4-gon), pentagon (5-gon), hexagon (6-gon) ... etc. .  
Be prepared to justify your method.

B. A student simplified the following expression:

$$-2(4 + 6) \div (-7 + 3)$$

The student's answer was -5. The teacher asked the student, "What did you do to determine your answer of -5?" The student said, "I used PEMDAS to simplify the expression." Is the student correct?

C. Which equation does not have the same solution as  $\frac{12}{x} = \frac{45}{60}$ ?

a.  $\frac{12}{45} = \frac{x}{60}$

b.  $\frac{x}{12} = \frac{60}{45}$

c.  $\frac{x}{60} = \frac{12}{45}$

d.  $\frac{60}{x} = \frac{12}{45}$

D.

A *net* is a two-dimensional figure that can be folded into a three-dimensional object.

Sketch three different nets that will form a cube.

E.

A researcher is conducting a longitudinal study on heart disease. As present, 256 subjects have agreed to participate in the study. In order to have valid and reliable results, the researcher needs the largest sample size possible, with at least 1,200 subjects from the target population. Will 944 additional subjects be enough for the study? How about a lesser number of subjects? A greater number of subjects?