The Weekly Rigor

No. 127 "A mathematician is a machine for turning coffee into theorems." November 26, 2016

SAT Math Test Problem Children: Geometry

(Part 1)

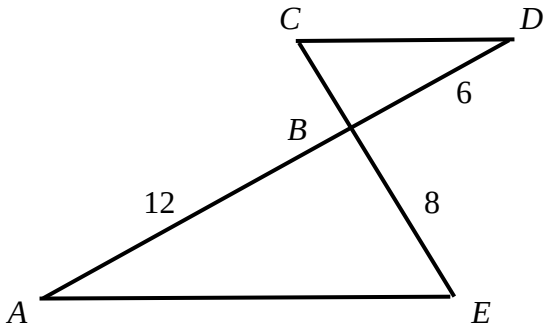
INTRODUCTION

The College Board has posted 280 math problems consistent with the new version of the SAT, which was launched earlier this year. These problems show up on four practice exams for the SAT and one practice exam for the PSAT. Certain categories of math questions come up repeatedly in the practice exams and are likely to challenge even the best of math students. I call these categories "problem children." This article will address the category dealing with geometry.

The College Board presents problems involving geometry in four formats. Here is one example of each format:

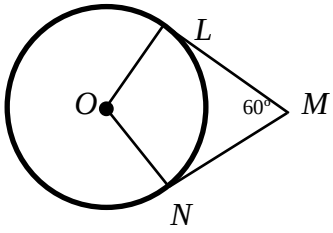
1. In triangle *ABC*, the measure of $\angle B$ is 90º, $BC = 12$, and $AC = 15$. Triangle *DEF* is similar to triangle *ABC*, where vertices *D*, *E*, and *F* correspond to vertices *A*, *B*, and *C*, respectively, and each side of triangle *DEF* is $\frac{1}{3}$ the length of the corresponding side of triangle *ABC*. What is the value of sin *F* ?

2.



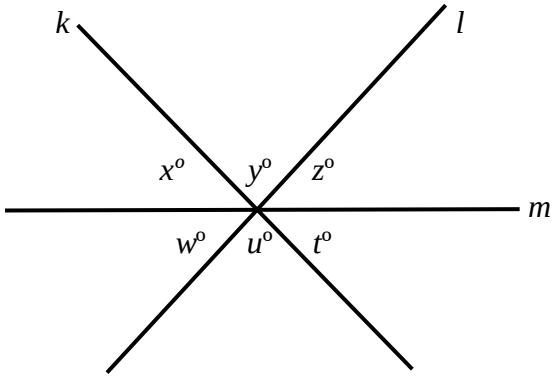
In the figure above, $\overline{AE} \parallel \overline{CD}$ and segment *AD* intersects segment *CE* at *B*. What is the length of segment *CE* ?

3.



In the figure above, point *O* is the center of the circle, line segments *LM* and *MN* are tangent to the circle at points *L* and *N*, respectively, and the segments intersect at point *M* as shown. If the circumference of the circle is 93, what is the length of minor arc $\widehat{LN}$?

4.



Note: Figure not drawn to scale.

In the figure above, lines *k*, *l*, and *m* intersect at a point. If $x + y = u + w$, which of the following must be true?

I. $x = z$
II. $y = w$
III. $x = u$

A) I and II only
B) I only
C) II and III only
D) I, II, and III