The Weekly Rigor

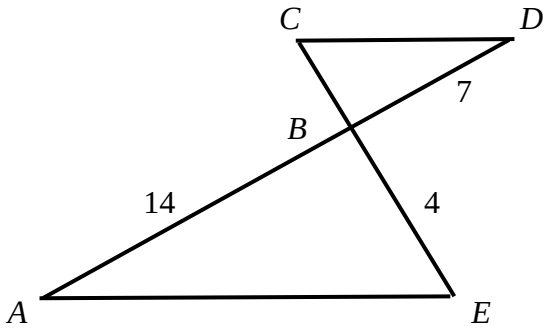
No. 151 "A mathematician is a machine for turning coffee into theorems." May 13, 2017

SAT Math Test Problem Children: Randomized Problem Set 2

(Part 4)

24. In triangle *ABC*, the measure of $\angle B$ is 90º, $BC = 15$, and $AC = 25$. 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 $\frac{1}{5}$ the length of the corresponding side of triangle *ABC*. What is the value of sin *F* ?

25.



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

26. What is the sum of all values of *m* that satisfy $m^2 - 8m + 4 = 0$?

27.

$3x + b = 5x - 7$
$3y + c = 5y - 7$

In the equations above, *b* and *c* are constants. If *b* is *c* minus $\frac{1}{4}$, which of the following is true?

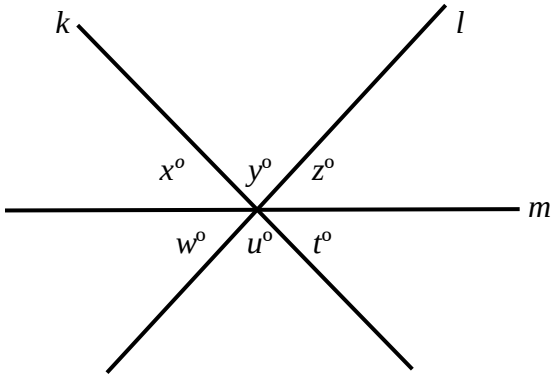
A) *x* is *y* minus $\frac{1}{4}$.

B) *x* is *y* plus $\frac{1}{2}$.

C) *x* is *y* minus $\frac{1}{8}$.

D) *x* is *y* minus 1.

28.



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. $y = t$
II. $z = u$
III. $y = w$

A) I and II only
B) I and III only
C) II and III only
D) None