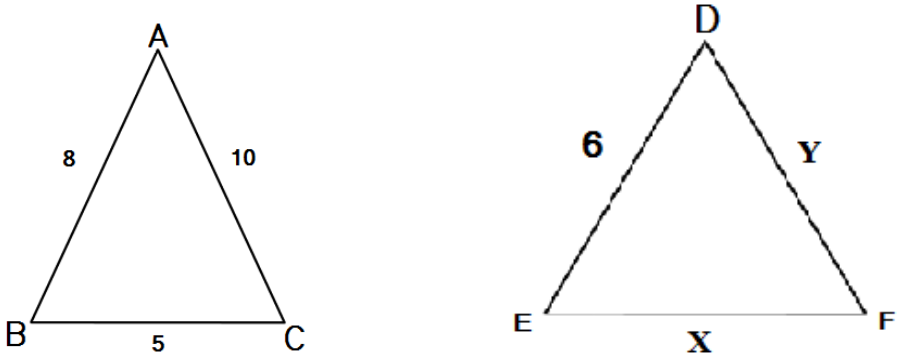
1st Annual WSMA Math Bowl – May 27, 2011

Preliminary Round 3

1	Evaluate $(i+1)^6$.	$-8i$
2	How many integers x satisfy $\sqrt{13} < x^2 < \sqrt{300}$?	6
3	Given that triangles ABC and DEF are similar, find the product of the lengths of sides X and Y. 	$\frac{225}{8}$
4	If x and y are integers such that $25 = y^2 - x^2$, what is the least possible value of $x + y$?	-25
5	If $f(x) = 1 + x + x^2$, what is $f(2) \cdot f\left(-\frac{1}{2}\right)$?	$\frac{21}{4}$
6	If 7 two-sided coins are flipped, what is the probability that at least 4 are heads?	$\frac{1}{2}$
7	If $\frac{ab}{c} = \frac{bc}{a} = \frac{ac}{b} = 1$, what is $a^2 + b^2 + c^2$?	3
8	Compute the largest possible n such that 10^n divides 200!	49
9	What is $101011_2 + 10101_2 + 10101_4$ in base four?	11101_4
10	What is the sum of the squares of the roots of the equation $y = x^3 - 7x^2 - 4x + 11$?	57

EX	**Extra Question (only if needed):** When $-90 \leq x \leq 720$ and x is in degrees, how many times does the line $y = \frac{x}{810}$ intersect $y = \sin x$?	4

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