Knights of Pi Math Tournament – Dec. 12, 2009

Algebra & Operations 7th/8th

1	Say we create a new mathematical operator "%". If we define $(a \ \% \ b)$ as $(a+b) \times (a-b)$, then compute $((((1\%2)\%3)\%4)\%5)\%6$.
2	What is three times the sum of x and y? $-30 + 2x = 30 - 2y$ $x + y - 15 = 15$
3	What is $f(f(g(g(1)))) \ - \ g(g(f(f(1))))$, given: $f(x) = 2x + 8$ $g(x) = 2x - 2$
4	Express y in terms of x. $\sqrt{\frac{y^2}{x}} = 5$
5	Currently, Bob is twice as old as Billy. Six years from now, Billy's age will be 5/6 of Bob's current age. What is the sum of Bob and Billy's current ages?
6	Simplify: $11^{-1} \times 17^3 \times 13^{-1} \times 17^{-1} - 2$
7	A student scored 97% on two English tests, 89% on a history test, and 86% on three math tests. What is his average score for the 6 tests? (Express your answer as a decimal rounded to the nearest tenth.)
8	Evaluate as a mixed number: $\frac{2\frac{5}{7}}{3\frac{1}{5}} + 4\frac{1}{2}$
9	If 1234 inches of rain fell in Seattle during 2007, what was the average rainfall that year in inches per minute?
10	Solve for x: $5x + 7y + 3z = -8$ $10x - 70y + z = \ -297$ $-x + 2y - z = \frac{98}{5}$

