Knights of Pi Math Tournament – Dec. 4, 2010

Algebra & Operations 5th/6th

1	Compute the expression: $123 + \frac{456}{3} + 789$
2	It is common knowledge that it is almost always cheaper to buy items in bulk than it is to buy them individually. If 1 candy bar costs $\$2.50$, and 12 candy bars bought in bulk cost $\$15.00$, how much cheaper is it to buy 12 candy bars in bulk than to buy 12 candy bars individually?
3	Solve for x: $$3x + 4 = 4x - 12$$
4	Austin has 6 coins in his pocket. He knows that he only has quarters, dimes, and nickels, and also that the 6 coins are worth $\$1.00$ in total. How many nickels are in Austin's pocket?
5	On a farm with only horses and chickens, farmer Billy counts 21 heads and 60 legs (excluding his own head and 2 legs). How many horses are there on the farm?
6	I own a machine which takes an integer, divides it by 3, adds 79, divides by 3 again, then reverses the digits of the number. If the machine outputs 82, what number did I enter into the machine?
7	Sally is currently 13 times as old as Joe. If Sally will be only 3 times as old as Joe in 10 years, what is the sum of Sally and Joe's current ages?
8	Solve for c in terms of a and b. $$\frac{a - b - c}{2} = 2a + b + c$$
9	Find the sum of the sequence: $1 + 5 + 9 + \cdots + 40$.
10	Solve the system of equations and give your answer as an ordered triplet (x, y, z). $$\begin{aligned} 2x &+ 2y &+ 2z &= 12 \\ 3x &+ y &- z &= 12 \\ -x &- 13y &+ 2z &= 12 \end{aligned}$$

