

I U P U I
MATH CLUB TEASER #66

September 23, 2011
(due September 30, 2011)

SOLUTION

Call s the number of marbles in a small bag, and ℓ the number of marbles in a large bag; clearly s is at least 1, and at most ℓ . If $s = 1$, we have to distribute $233 - 7 = 226$ marbles in the 18 large bags, so each bag would get $226/18 = 12.555\dots$ marbles. If $s = \ell$, we have to distribute 233 marbles equally among $18 + 7 = 25$ bags, so each bag would get $233/25 = 9.32$ marbles.

The above narrows down the possible values for ℓ to 10, 11, or 12.

$\ell = 10$: This takes care of 180 marbles. The remaining 53 marbles do not fit evenly into 7 bags.

$\ell = 11$: This takes care of 198 marbles. The remaining 35 marbles fit evenly in the small bags with 5 in each.

$\ell = 12$: This takes care of 216 marbles. The remaining 17 marbles do not fit evenly into 7 bags.

The solution: 5 marbles in a small bag; 11 marbles in a large bag.

(You could also try to fit 23 marbles in the small bags, and 4 in the large bags, but that doesn't really sound like a correct solution, does it?)

SOLVED BY:

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