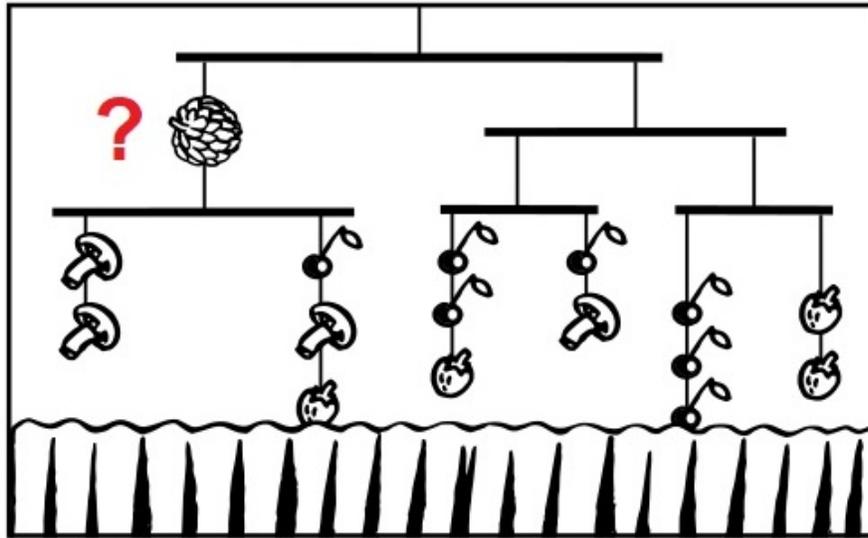




8. The hanger shown in the diagram is balanced. All cherries weigh the same, all mushrooms weigh the same, and all strawberries weigh the same. The bottom of the hanger is hidden from view. Two strings could have more weights extending below the curtain. Maybe there are more, maybe there are not!

How many grams does the exotic fruit weigh, if the weight of one cherry is 7 grams?

Assume that all parts of the hanger itself (horizontal bars and vertical strings) weigh nothing.



9. In the “expression”

$$1 @ 2 @ 3 @ 4 @ 5 @ 6 @ 7 @ 8 @ 9 @ 10 @ 11 @ 12 @ 13 @ 14$$

each of the thirteen @ symbols is replaced with either  $\times$  or  $\div$  such that the value of the resulting expression is an integer.

Find the greatest common factor of all such integer values.

10. Suppose 101 girls buy greeting cards. One of the girls, Suzie, buys 1000 fewer cards than the girls’ average.

How many more cards should Suzie buy so that she has 1000 more cards than the new girls’ average?

Assume that the other girls do not make any purchases after their initial purchase.

11. In triangle  $ABC$ , points  $D$  and  $E$  are chosen on side  $\overline{AC}$  such that  $AD = AB$  and  $CE = CB$ . Rays  $\overrightarrow{BD}$  and  $\overrightarrow{BE}$  divide angle  $ABC$  into three non-overlapping angles. The degree measures of these three angles are in the ratio 3 : 4 : 5 (in some order).

Compute the greatest possible value of the largest of these degree measures.

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12. The diagram shows three famous RSM cafes, **R**, **S**, and **M**. It takes one step to move from one of these cafes directly to another.

How many different ways are there to start at **R** and end at **M** in exactly ten steps?

One possible way is

***R - M - R - S - M - S - R - M - S - R - M.***

