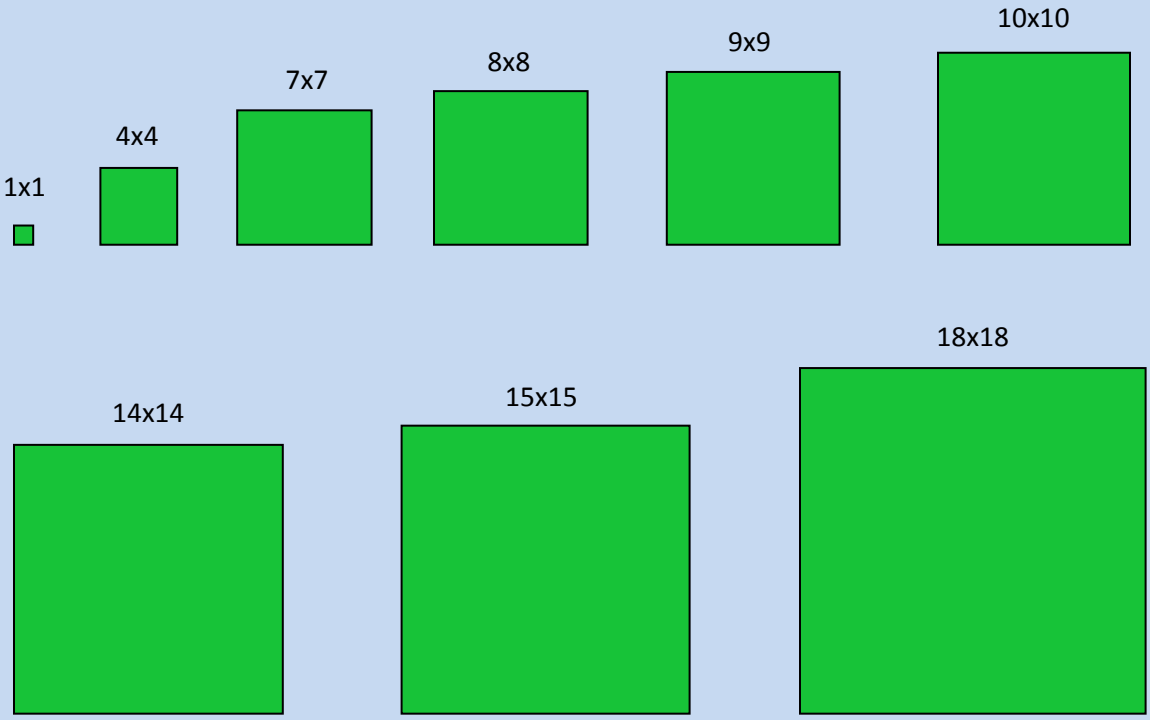
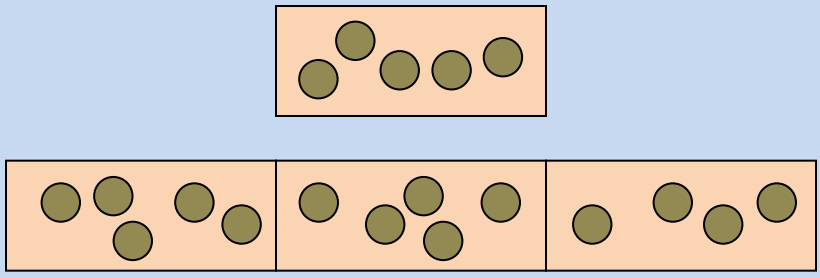
Math Challenge Questions

(November, 2009)

1) Fit squares (one of each) of side lengths 1, 4, 7, 8, 9, 10, 14, 15, and 18 into a rectangle with no holes or missing parts. (It may help to use graph paper.)

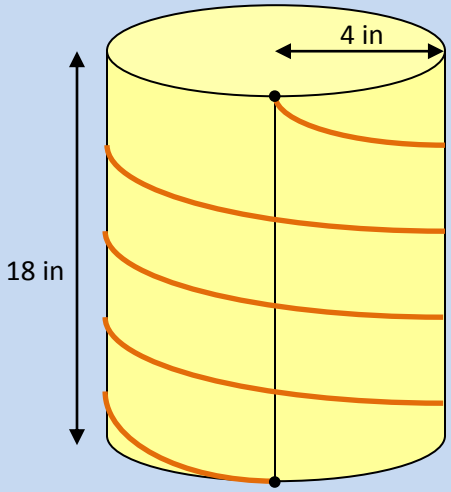


2) Fourteen students can be split into a team of 5, another team of 5, and a third team of 4. Five students can be 'split' into one team of 5. For what other size groups—besides five and fourteen—can the group be split into teams of exactly 4 or 5 each?

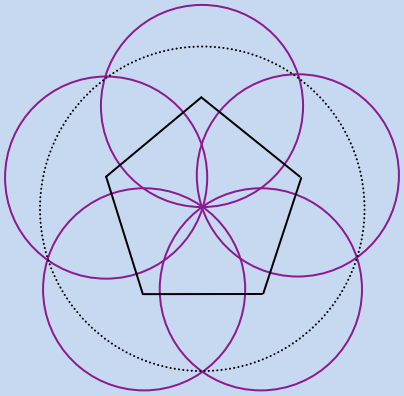


1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, …

3) A string wraps 4 times around a cylinder, attaching to the edge of the top directly above where it attaches to the edge of the bottom. If the cylinder is 18 inches tall and has a radius of 4 inches, how short can the string be?



4) Five disks of radius 1 are placed symmetrically (as shown) so that their centers form a regular pentagon and their circumferences all pass through the center of the pentagon. What is the radius of the largest circle covered by the five disks?



5) Given a disk of radius 5, how big a slice should you cut out of it to make a cone shaped cup with the largest volume?