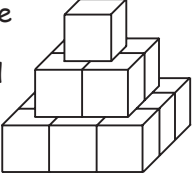
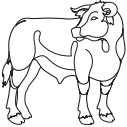

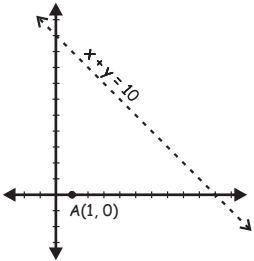




Workout 6

- _____ A certain fraction is equivalent to $\frac{2}{7}$. If the numerator is doubled and the denominator is decreased by 1, the value of the new fraction is $\frac{3}{5}$. What is the sum of the numerator and the denominator of the original (unsimplified) fraction?
- _____ units In a right triangle, the altitude to the hypotenuse is drawn. It divides the hypotenuse into two parts that are in the ratio 4:9. The length of the altitude is 12 units. What is the perimeter of the triangle? Express your answer in simplest radical form.
- _____ colors Unit cubes of assorted colors are stacked in three layers with one cube in the top layer, a square arrangement of four cubes centered below it for the second layer, and a square arrangement of nine cubes centered below that for the third layer, as shown in the diagram. Two cubes of the same color may only touch on one edge and no faces. What is the minimum number of colors required for this to be possible? 
- _____ cows A barn contains some four-legged cows, some three-legged stools, and some two-legged farmers. There are two more stools than farmers, and there are three times as many cows as stools. If the barn contains 132 legs, how many cows does it contain? 
- _____  The winner of baseball's World Series is the first team to win four games. Ties are not allowed in baseball. Suppose that the Rangers and the Astros meet in the World Series. If the probability that the Rangers win each game is $\frac{1}{2}$, what is the probability that the World Series will require seven games to determine the winner? Express your answer as a common fraction.
- _____ times A 500-gallon tank contains a 10% acid B solution. Each day 100 gallons are drained from the tank and replaced with 100 gallons of 2% acid B solution. What is the minimum number of times this process must be carried out so that the 500 gallon solution is less than 5% acid B?
- _____ (,) The point A(1, 0) is reflected over the line $x + y = 10$ to point B. What are the coordinates of point B? 
- _____ In the infinite sequence of increasing positive integers 1, 2, 3, 4, 6, 8, 9, 11, 12, 13, 16, ... every integer is included that is neither a multiple of 5 nor a multiple of 7. What is the 200th term in this sequence?
- _____ kph The speed of a stream is 3 km per hour. A boat travels upstream 12 km and then returns to its original position downstream along the same route. If the speed of the boat in still water is 9 km per hour, what is the average speed of the boat for the entire round trip?
- _____ cu units What is the volume of the pyramid that has vertices at (0, 0, 0), (5, 0, 0), (0, 6, 0) and (0, 0, 4)?