INTRODUCTORY RELAY – SEPT 2018

Each person on a 3-person Relay team receives a different math problem. The 1st person solves the problem and passes back the answer to the 2nd person. The answer is nearly always a number. It can be any type of number including irrational and complex numbers. Eventually, the 2nd person passes back an answer to the 3rd person. The 3rd person solves a problem and turns in an answer. ONLY the 3rd and final answer counts for points! The team receives more points for a correct answer after 3 minutes than a correct answer after 6 minutes.

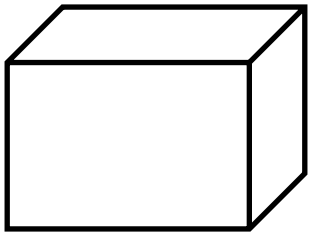
The first expression in the problems for the 2nd person and the 3rd person will be:

T = TNYWR or "*The Number You Will Receive*"

The variable T will appear in each problem for the 2nd and the 3rd person. Usually the 2nd and 3rd students can make LOTS of progress solving the problem before receiving T from the student in front of them. Usually, the 2nd and 3rd person will be able to write their answers as a formula in terms of T. For example: x = (T + 5)/ 8. When T "arrives", substitute and pass back the numerical answer. In this example, if T = 7, pass back 3/2.

1-1 A 9 by 9 by 4 rectangular box is constructed from 9*9*4 = 324 unit cubes.

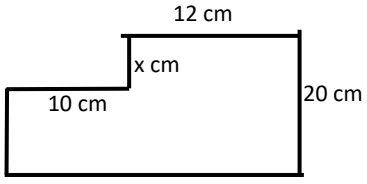
All six faces of the box are painted red. How many of the original 324 unit cubes have exactly 2 faces painted red?



1-2 T = TNYWR Javon buys a bag of Jelly beans on Saturday morning. Javon eats 20% of the jelly beans on Saturday and eats 20% of the remaining jelly beans on Sunday. At the end of Sunday, there are T jelly beans left. How many jelly beans did Javon purchase Saturday morning?

1-3 T =TNYWR The area of this shape is 4T square centimeters.

Assume that all corners are right angles. Compute x.



ANSWERS

1-1. 64 The cubes on each edge, which are not a corner cube, have exactly two faces painted red. 4Eight edges have length 9, each contributes 7 cubes with two red faces. Four edges have length 4, each contributes 2 such cubes. 8*7 + 4*2 = 64

1-2. 100 Let N equal the original number of jelly beans. On each day, 80% or 4/5 are not eaten. N* 4/5*4/5 = T. Therefore, N = 25/16*T . Since T = 64, N = 25/16*64 = 100.

1-3 **4** Area = 4T = (10+12)*20 – 10x; 4T = 440 – 10x; 10x = 440 – 4T; x = (440 – 4T)/10 = (440 – 400)/10 = 4