

Math Magic 8

Start:

Teacher tells the student(s) to do the following:

Step 1: Write a three-digit number with all the digits different example: 257

Step 2: Form all the possible two-digit numbers from this number
25
27
52
57
72
75

Step 3: Find the sum of the those two-digit numbers 308

Step 4: Find sum of the three original digits $2 + 5 + 7 = 14$

Step 5: Divide the sum in step 3 by the sum in step 4 $308/14 = 22$

Mental Trick:

The teacher tells them that their answer is 22. (Note: The answer is always 22!)

Why it works:

Step 1: Let the three-digit number be: abc

Step 2: The six possible two-digit numbers are:
 $10a + b$
 $10a + c$
 $10b + a$
 $10b + c$
 $10c + a$
 $10c + b$

Step 3: The sum will be $20(a + b + c) + 2(a + b + c) = 22(a + b + c)$

Step 4: Sum of the three original digits is $a + b + c$

Step 5: Dividing the sum in step 3 by the sum in step 4 gives $22(a + b + c) / (a + b + c) = 22$