S.M.ART School **MAB5 HW due 06-11-2024**

W1 There are 324 marbles in the bag. 3/4 of them is green, 2/9 is red. The rest is blue ones. How many blue marbles are there?

W2 A motorist goes 200 miles in 150 min. How far does he go in X hours?

W3 A barge travels twice as fast when it is empty as when it is full. It travels 20 miles north with a cargo, spends 20 minutes unloading, and returns to its original port empty, taking 8 hours to complete the entire trip. What is the speed of the barge when it is empty?

W4 The sum of two numbers is 5 / 8. If 2 times of the reciprocal of first number is equal to three times of reciprocal of the second number then find both numbers.

Q1 Mia has a roll of 32 cents stamps. She has no other stamps. She must send a package, which requires $3.00 worth of stamps. What is the minimum number of stamps she will have to put on the package? By what percentage must she overpay to send this package (relatively to $3.00)?

Combine ratios

A1 $x / (x - 1) + (x - 1) / x$

A2 $x / (x - 1) - (x + 1) / x$

A3 Make sure you understand how to prove Difference Of Squares Identity

$(a - b) * (a + b) = a^2 - b^2$

A4 Make sure you understand how to prove Square Of Difference Identity

$(a - b)^2 = a^2 - 2*a*b + b^2$

The next two examples are from a Russian Math book. The only two differences in notation are that colon here, ":" - means "divide" and comma "," symbolizes decimal point.

So, when you see "0,125", for instance, then you know it means 0.125 or 1/8.
And "0,6 : 0,8" would mean "0.6 / 0.8 = ¾".

C1

$$\frac{8,1 : 0,4 : 2,7 \cdot 3,06}{10,2 : 2,4 \cdot 12,5 \cdot 0,8};$$

1. *What you divide by goes to the denominator. And what you divide by in denominator goes to the numerator.*
   So, you should understand that C1 ratio can be also written as
   *(8.1 * 2.4 * 3.06) / (0.4 * 2.7 * 10.2 * 12.5 * 0.8).*

2. *Next step is, probably, to start reducing the fraction. It is a good idea to be getting rid of decimal points by multiplying top and bottom by the same power of 10.*

   *For example, 3.06 / 10.2 is the same as 306 / (102*10) which is 0.3. and so on.*

   Thus, you have
   *(8.1 * 2.4 * 0.3) / (0.4 * 2.7 * 12.5 * 0.8).*

   The idea is to keep rewriting the C1 ratio such that after each step it is getting simpler.

C2

$$\frac{0{,}3 \cdot 7{,}8 : 0{,}39 - \frac{5}{12} \cdot 3{,}6}{1\frac{5}{13} \cdot 0{,}26 : 0{,}1 + 0{,}4};$$