

Homework 7 - History of Math

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October 3, 2021

Problem 1

We need to find solutions to the equation $(19n + 14m) - (19p + 14q) = 1$, where n, m represents the number of coins you give while p, q represents the coins you get back as change for.

If we give 3 \$19 coins which is \$57, and the cashier returns 4 \$14 coins which is \$56, then we essentially paid \$1 for the coffee.

Problem 2

Similar to the problem above we need to find solutions to the equation $(109n + 95m) - (109p + 95q) = 1$, where n, m represents the number of coins you give while p, q represents the coins you get back as change for.

If we give 70 \$95 coins which is \$6650, and the cashier returns 61 \$109 coins which is \$6649, then we essentially paid \$1 for the coffee.

Problem 3

Similar to the problem above we need to find solutions to the equation $(37n + 16m) - (37p + 16q) = 1$, where n, m represents the number of weights we put on one side while p, q represents the number of weights on the other side.

Put 7 weights of 16kgs for a total weight of 112 kg on the left side of the scale, and then put 3 weights of 37 kg on the right for a total weight of 111 kg on the right. Then by adding the 1kg coffee to the right side we can equalize the scale.