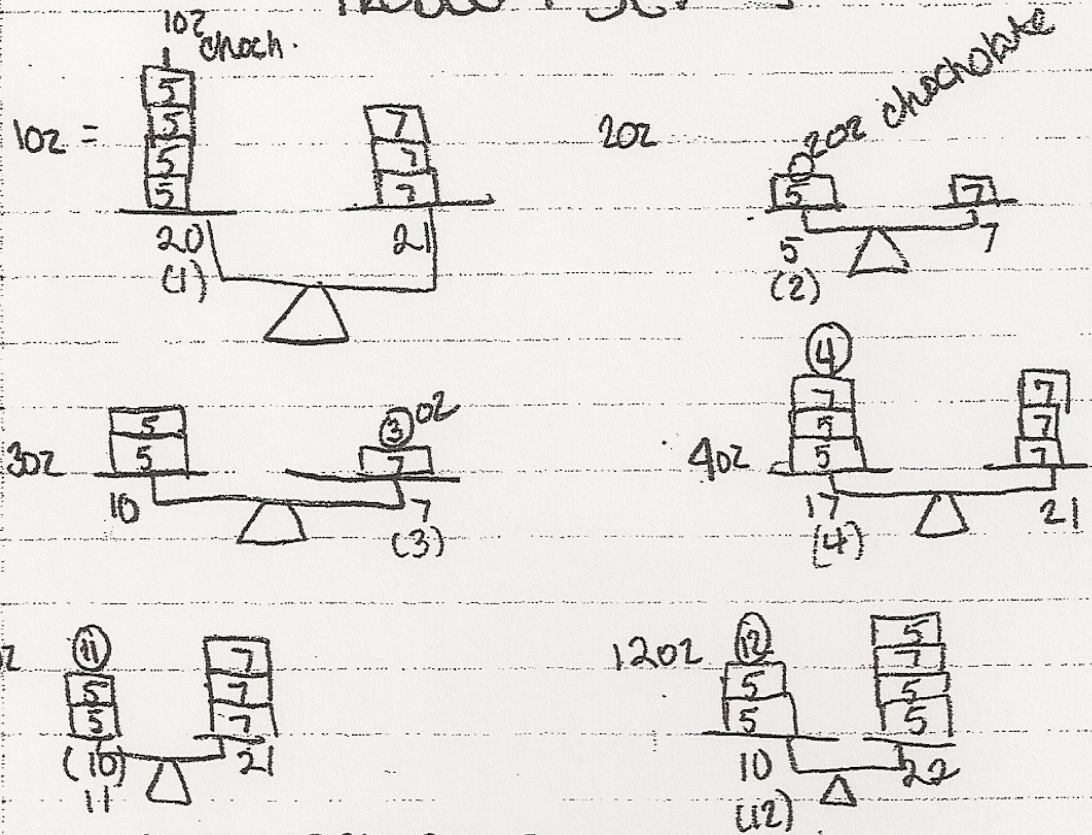
PROBLEM SET #4

#1)



You can weigh out any weight!

Comments:

This problem was solved in a great way for the visual learner. Rather than using only words, the student drew pictures to show what they did to solve the problem.

However, I would like to have seen how they determined that any weight could be found using 5oz and 7oz weights.

1) - 1 ounce:
Put four 5oz weight on one side, and three 7oz weights on the other. add the chocalate

- 2ounce:
Put 5 weights on one side and 7weight on the other. add the chocolate to the 5 weight sides to balanced.

-3ounces
- Put 5+5 weights on one side, and 7 weights on the other side, add chocolate to the 7-oz sides until it balanced
(5+5) - 7 = 10-7 = 3 ounces

- 4ounces
Two 5 oz weights on one side, Two 7oz weights on the other side. Add chocolate to the 5oz weights to balance out
(2x7) - (2x5)
= 4 ounces

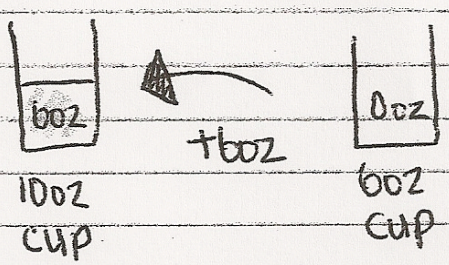
-11ounces
Put five 5oz weights on one side, and two 7oz weights on the other side, add the chocolate to balanced
(5x5) - (2x7) = 25-14 = 11ounces
on the 7oz weights

-12ounces
Put six 5 oz weights one side, and six 7oz weights on the other side, add chocolate to the 5 oz weights to balance out
(6x7) - (6x5) = 42 - 30 = 12ounces

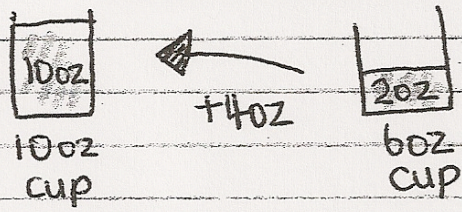
- Given the sufficient 5-oz and 7-oz weights, she would weight out every weight she wants. While we look at the multiple of 5 and 7.
5, 10, 15, 20, 25, 30, 35, 40
7, 14, 21, 28, 35, 42, 49, 56
diff. 2, 4, 6, 8, 10, 12, 14, 16 → increase by two.
5, 10, 15, 20, 25, 30, 35, 40
7, 14, 21, 28, 35, 42, 49, 56,
9, 11, 13, 15, 17, 19, 21 ... ⇒ also increase by 2.
which means, we will get each weight by subtracting the difference of the multiple of 5 and 7.

Comments: This student's solution was perfect. The student answered both parts of the problem in a very detailed manner. The student described how they solved the problem and they showed their work on everything.

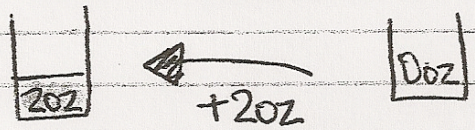
#2) First step: Fill the 6oz cup and empty it to the 10oz cup.



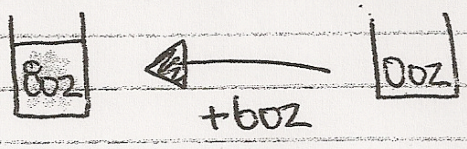
Step 2: Fill up another 6oz cup and fill up the rest of the 10oz cup, where 6oz of juice already exists. There will be 2oz left in the 6oz cup.



Step 3: Empty the filled 10oz cup and pour the 2oz of water back to the 10oz cup.



Finally, pour another 6oz cup, full of water, to the 10oz cup that already has 2oz of water.

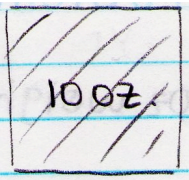


8oz of juice is made!

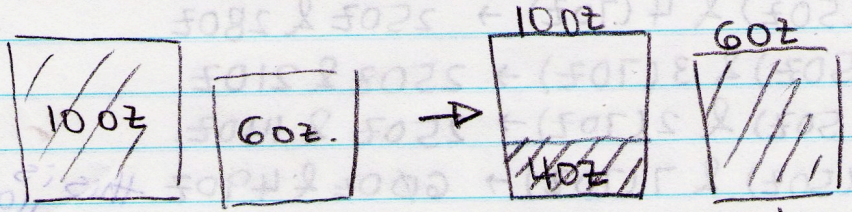
Comments:

This student did an excellent job displaying how they solved problem #2. They broke it down into steps and drew pictures for each step. This student shows a clear understanding of the problem.

(2) 1. fill a 10oz. cup all the way.



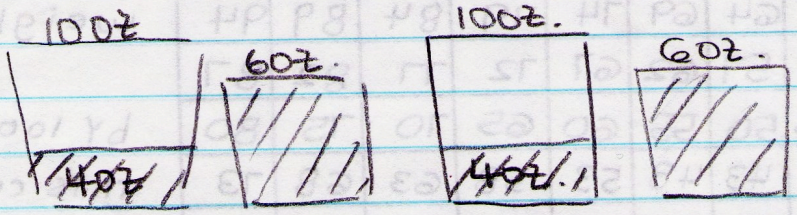
2. take the 10oz. cup & pour it into the 6oz. cup until it is full.



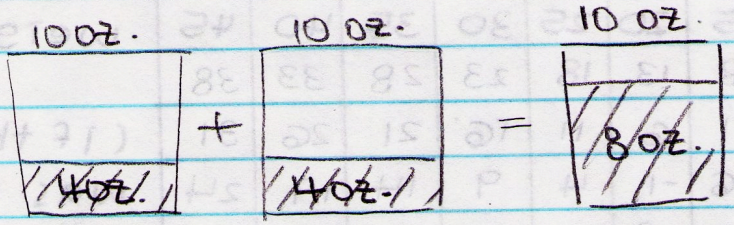
* You are left w/ 4oz. in the 10oz cup.

3. repeat steps 1 & 2

↳ You now have 2 4oz. left in the 10oz cups



4. with the 2 4oz. left in the 10oz. cups, pour one of it into the other cup & you have 8oz.



Comments: This student did an excellent job in drawing out their solution to this problem. This best part about the solution was that the students described each of their steps in addition to drawing what they were doing. Therefore it was a great visual solution and written solution.

#3) A 12oz weight & 15oz weight commonly has a gcd of 3.

$(15 - 12) = 3$ $\quad gcd(12, 3)$

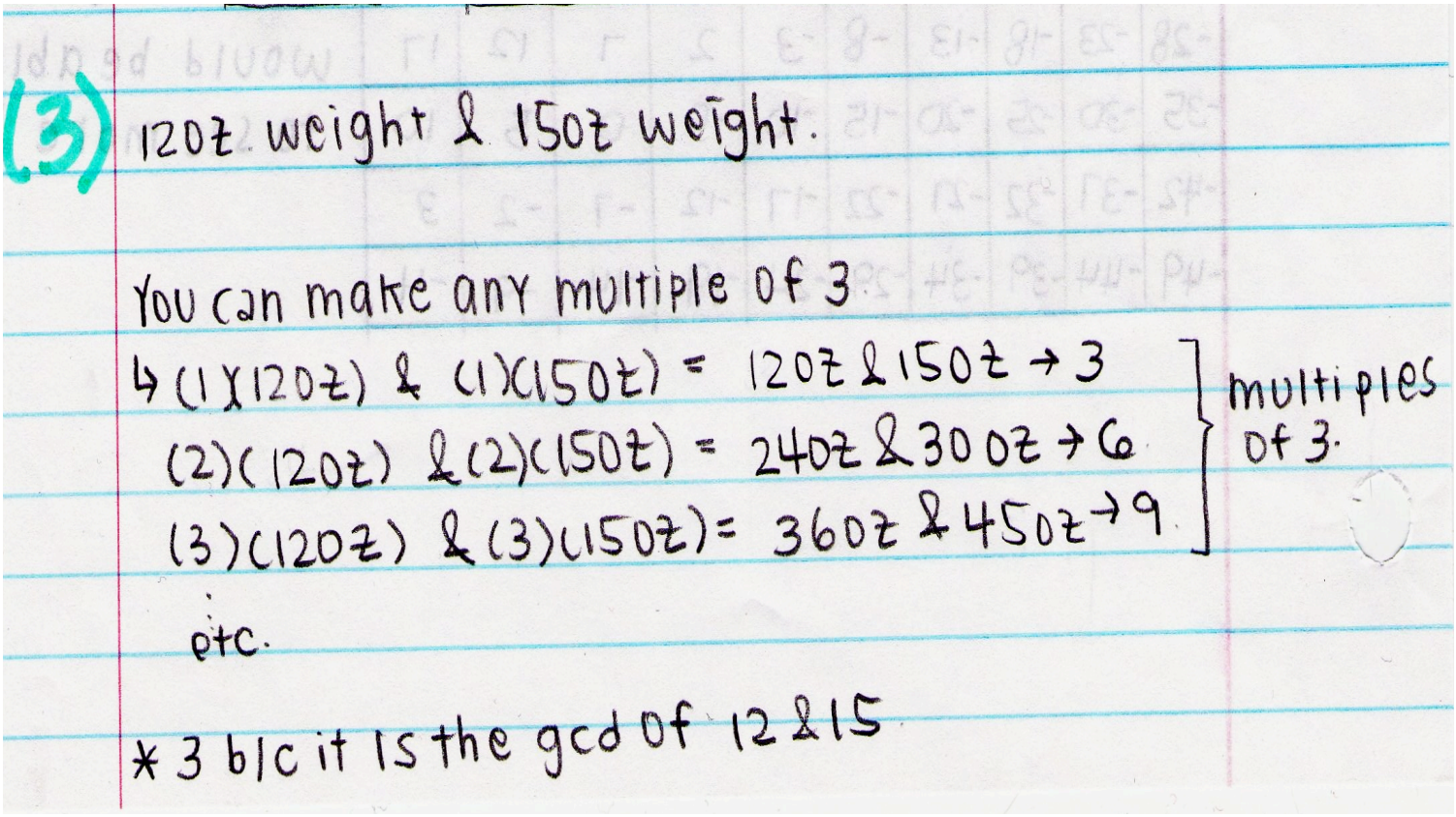
$(12 - 4(3)) = 0$ $\quad gcd(3, 0)$

$gcd = 3$

<u>All</u> weights will be in a multiple of 3.

<u>Comments:</u>

This student used the Euclidean Algorithm to solve for the GCD of 12 and 15.
I thought this approach tied in nicely with what we have learned in class.



Comments: This student did a great job in explaining why “3” was such an important number. In addition to that the student also gave examples as to why you would be able to make any multiple of three given the 12oz and 15oz weights. To make this solution perfect, the student could have provided a combination chart highlighting the multiples of three as proof to the solution given.