Now with every cent *gain* he must combine a cent *loss*; hence he must have

$$\left.\begin{array}{l}\frac{1}{4}\text{ lb. at }8\text{c.}\\ \frac{1}{2}\text{ lb. at }14\text{c.}\\ \frac{1}{3}\text{ lb. at }9\text{c.}\\ \frac{1}{2}\text{ lb. at }14\text{c.}\end{array}\right\} = \left\{\begin{array}{l}3\text{ lb. at }8\text{c.}\\ 6\text{ lb. at }14\text{c.}\\ 4\text{ lb. at }9\text{c.}\\ 6\text{ lb. at }14\text{c.}\end{array}\right.$$

He must, therefore, have 3 lb. of brown sugar, 4 lb. New Orleans, and 12 lb. refined.

We may show that these quantities will make the mixture required, as follows:

3 lb. at	8c. per lb.	= 24c.
4 lb. at	9c. "	= 36c.
12 lb. at	14c. "	= 168c.

19 lb. = whole mixture. 228c. = value of mixture.

Hence, if 19 lb. be worth 228c.

1 lb. is worth $\frac{228}{19} = 12$c.

Or we may reason thus: The 1c. *gained* on the $\frac{1}{4}$ lb. of brown exactly balances the 1c. *lost* on the $\frac{1}{2}$ lb. of the refined. Hence he must take $\frac{1}{4}$ lb. of the brown and $\frac{1}{2}$ lb. of the refined, or 2 lb. of one and 4 lb. of the other.

Similarly, for every 2 lb. of New Orleans there must be 3 lb. of refined. As 4 lb. of refined were required to balance the brown, and 3 lb. of the refined to balance the New Orleans, there must be 7 lb. of the refined in the compound. Therefore, the respective quantities are 2 lb. brown, 2 lb. New Orleans, and 7 lb. refined.

From the above we see that in examples of this kind a variety of answers may frequently be obtained, and all of them may be correct. To ascertain their correctness we resort to the method of proof given in this example.

From the above analysis we derive an easy practical method of solving such questions.

Ex. 2. How much sugar at 10, 13, 15, 17 and 18c. per pound must be taken to make a mixture worth 16c. per pound?