



Problem of the Week

Problem C and Solution

Meal Deal

Problem

Jessica and Callista go to the local burger joint. They both want to buy the meal deal. Jessica has $\frac{3}{4}$ of the money needed to buy the meal deal and Callista has half of the money needed to buy the meal deal. If the meal deal was \$3 cheaper, then together they would have exactly enough money to buy two of the meal deals.

What is the original price of the meal deal?

Solution

Solution 1:

Suppose that the cost of the meal deal, in dollars, is C . Then Jessica has $\frac{3}{4}C$ and Callista has $\frac{1}{2}C$. Combining their money, together Jessica and Callista have

$$\frac{3}{4}C + \frac{1}{2}C = \frac{3}{4}C + \frac{2}{4}C = \frac{5}{4}C$$

If the meal deal was \$3 cheaper, then the cost to buy one meal deal would be $C - 3$. If the cost of one meal deal was $C - 3$, then the cost to buy two meal deals at this price would be $2(C - 3) = (C - 3) + (C - 3) = 2C - 6$.

Combined, Jessica and Callista would have enough money to buy exactly two meal deals at this reduced price. Thus, $2C - 6 = \frac{5}{4}C$.

Solving for C ,

$$\begin{aligned}2C - 6 &= \frac{5}{4}C \\2C - \frac{5}{4}C &= 6 \\ \frac{8}{4}C - \frac{5}{4}C &= 6 \\ \frac{3}{4}C &= 6 \\ 3C &= 24 \\ C &= 8\end{aligned}$$

Therefore, the original price of the meal deal is \$8.

**Solution 2:**

Since the new price of the meal deal is \$3 cheaper than the original price, then the original price must be more than \$3. We will use systematic trial and error to figure out the original price.

Suppose the original price of the meal deal was \$6. Then the reduced price would be \$3. Also, Jessica has $\frac{3}{4} \times \$6 = \4.50 and Callista has $\frac{1}{2} \times \$6 = \3 , and in total they have $\$4.50 + \$3 = \$7.50$. With \$7.50, they could buy exactly $7.50 \div 3 = 2.5$ meal deals at a price of \$3 each.

Suppose the original price of the meal deal was \$12. Then the reduced price would be \$9. Also, Jessica has $\frac{3}{4} \times \$12 = \9 and Callista has $\frac{1}{2} \times \$12 = \6 , and in total they have $\$9 + \$6 = \$15$. With \$15, they could buy $15 \div 9 \approx 1.67$ meal deals at a price of \$9 each.

We can see that the original price of the meal deal lies somewhere between \$6 and \$12.

Let's suppose the original price of the meal deal was \$8. Then the reduced price would be \$5. Also, Jessica has $\frac{3}{4} \times \$8 = \6 and Callista has $\frac{1}{2} \times \$8 = \4 , and in total they have $\$6 + \$4 = \$10$. With \$10, they could buy exactly $10 \div 5 = 2$ meal deals at a price of \$5 each.

Thus, we can see that the original price of the meal deal is \$8.