Cassie bought grapefruit for a charity breakfast. She purchased 5 boxes of large ruby red organic grapefruit, with a dozen grapefruit in each box. The supplier gave her a great price of $19 per box to support the charity. The charity is tax exempt, so Cassie won’t have to pay any more than the cost per box.

At the breakfast, the grapefruit will sell for $1.50 per half. How much profit will Cassie make for the charity if she sells all the grapefruit halves?

**Extra:** Cassie realizes that she might not sell all the grapefruit halves. How many does she need to sell to avoid losing money?

**MATH STANDARDS ALIGNMENT:**
Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

**Personal Finance Big Ideas:**
*What is Money, Setting Goals*

**METHOD 1**
First, I did 12(grapefruits in each box) times 5(boxes Cassie bought). The total grapefruits in all was 60. To figure out the cost, I did:

$19 \text{ (per box)} \times 5 \text{ (boxes bought)} = $95 \text{ spent}.

60 grapefruits x 2(because she sold these grapefruits in 1/2s) = 120 1/2s.

Each half was $1.50 x 120 halves = $180.00. To figure out her profit, I subtracted the cost of the grapefruits ($180.00 - $95.00 = $85.00). I then knew Cassie’s profit was $85.00.

To figure out the extra, I tried different numbers of halves and multiplied it by $1.50. My goal was to get $95.00. If Cassie sold 63 grapefruit halves it gave her $94.50 which was not enough. She had to sell 64 grapefruit halves to get back all of her $95.00. This gave her a profit of $1.00 (64 x $1.50 = $96.00).
METHOD 2
First, I multiplied the five crates of grapefruit by the number of fruits per box. 5 X 12 = 60 grapefruit.

Next, I multiplied the number of grapefruit she had altogether by 2. I knew that was how many halves she would sell. 2 X 60 = 120 grapefruit halves.

Then, I multiplied the number of crates by the price per crates. 5 X $19.00 = $95.00.

After that, I multiplied the number of grapefruit halves she sold by the cost per half. 120 X $1.50 = $180.00.

Finally, she gets $180.00 from selling the grapefruit, but the grapefruit cost her $95.00. So I subtracted $95.00 from $180.00, which equals $85.00. So she only made $85.00.

METHOD 3
Cassie went to the store and bought 5 boxes of grapefruit. There are:

12 grapefruits per box
5 boxes of grapefruit
x12 grapefruits per box
--------
60 grapefruits in all

It is 19 dollars per box and she has 5 boxes.

19 dollars per box
x5 boxes
-------- 95 dollars

Cassie has 60 grapefruits which will cost 95 dollars.

Cassie needs them in halves so
60 grapefruits
x2 (halves)
-------- 120 grapefruit halves
$1.50 per half

6 wholes for $1.50 each is $9.00
$1.50
x 6
-------- $9.00

You need 12 grapefruits per box for $1.50 so double $9.00.
$9.00
x 2
-------- $18.00
You need to double $18.00 because she is selling halves.

$18.00
x 2
---------
$36.00

She has $36.00 per box.

She has 5 boxes so

$36.00
x 5
---------
$180.00

She makes $180.00.

She needs to pay the clerk $95.00

$180.00
- 95.00
---------
$85.00

Therefore Cassie has 85 dollars left.

METHOD 4
I started by drawing a picture of the 5 boxes with 12 grapefruits each, so I could see how many grapefruit there were.

Then I wanted to figure out how many grapefruits there were all together:

5 boxes, 12 per box

12 x 5 = 10(5) + 2(5)
= 50 + 10
= 60 grapefruit.
I also wanted to know how much the price was for those 60 grapefruit:

So those 60 grapefruit cost $95 total. I know now, to make a profit, Cassie would have to make more than $95 selling grapefruit. First I’ll figure out how much she makes from selling all the grapefruit and then I will subtract $95 to find the profit.

So when she sells all the grapefruit she makes $180. The profit:

$180 - $95 = $85.

So Cassie’s profit is $85.