

## Collaborating Coupons

Act 1

### Collaborating Coupons

I went to Sports authority with two coupons.



The shoes I wanted were on sale



Act 2

What other information do you need?

- Sales tax in Union City, Ca (summer of 2013) was 9.5%
- Sports Authority allowed me to apply all three discounts

Additional information you may choose to give

- The discounts were applied individually in an order that resulted in the lowest possible cost. I don't give this information. Instead I ask what their group to come up with a proposal for what they would charge for the shoes.

# SPORTS AUTHORITY

Sports Authority #678  
31200 Court House Drive  
Union City, CA 94587  
510.491.0473

## SALE

GT-1000(4E/LIGER/8	33554523	56.19 A
REGULAR PRICE	99.99	
PRICE BEFORE DISCOUNT	74.99	
15% OFF COUPON		11.25-
LOYALTY REDEEMED		7.55-
SUBTOTAL		\$56.19
A = 9.500% Sales Tax		\$5.34
<b>TOTAL</b>		<b>\$61.53</b>
Cash		\$100.00
CHANGE		\$38.47

\* GET 5% BACK WITH THE LEAGUE \*  
Join our free rewards program at  
[sportsauthority.com/theleague](http://sportsauthority.com/theleague)

Already a member?  
Go online to view or change  
your profile & print rewards.

All returns & exchanges require  
an original receipt dated within  
30 days of purchase & must be  
in original packaging with all  
components in unused condition  
or have manufacturer defect.



TOTAL SAVINGS  
**\$43.80**

07-10-2013 14:59:34 0678 002 761023 3562

Loyalty Card ID: 1005886436



Student work

The responses led to great discussion about methods, order, precision, applying the two percent discounts (can you add them? does order matter?) and revising work.

Some groups matched the receipt

Rounded

$$\approx \$61.53$$

Actual

$$= \$61.532019$$

$$\begin{array}{r} 99.99 \\ \times 0.75 \\ \hline 74.9925 \\ \textcircled{2} \\ 74.9925 \\ \times 0.85 \\ \hline 63.743625 \\ \textcircled{3} \\ - 7.550000 \\ \hline 56.193625 \end{array}$$

$$\begin{array}{r} 56.193625 \\ \times 0.095 \\ \hline 5.338394375 \\ + 56.1936250 \\ \hline 61.532019 \end{array}$$

...or almost matched the receipt

$$99.99 \cdot 0.75 = 74.49$$

$$74.99 \cdot 0.85 = 63.74$$

$$63.74 - 7.55 = 56.19$$

$$56.19 \cdot 1.095 = 61.52$$

**61.52**

Some groups subtracted the loyalty reward first and precision matters

$$\begin{array}{r} \$99.99 \\ - \$7.55 \\ \hline \$92.44 \\ \times .15 \\ \hline 46220 \\ + 92440 \\ \hline \$138660 \\ \textcircled{4} \\ \$78.57 \\ \times .25 \\ \hline 39285 \\ + 157140 \\ \hline \$19.6425 \end{array}$$

$$\begin{array}{r} \$92.44 \\ \times .15 \\ \hline 46220 \\ + 92440 \\ \hline \$138660 \\ \textcircled{5} \\ \$18.57 \\ - \$19.64 \\ \hline \$58.93 \\ \textcircled{6} \\ \$58.93 \\ \times 0.095 \\ \hline 5.598350 \\ \approx 56 \\ \textcircled{7} \\ \$58.93 \\ + \$5.60 \\ \hline \$64.53 \end{array}$$

Original: \$99.99

$$\begin{array}{r} 99.99 \\ - 7.55 \\ \hline 92.44 \end{array}$$

Tax: 9.5%

$$92.44 - (92.44/4) = 92.44 - 23.11 = 69.33$$

$$69.33 \cdot .15 = 10.3995 \approx 10.40$$

$$\rightarrow 69.33 - 10.40 = 58.93 - (58.93 \cdot .095) = 58.93 + 5.56 = 64.49$$

**\$64.49**



I am going to buy my shoes at this group's store. They combined the percent. They also had a great argument about whether they could add a penny at the start and then subtract it back at the end. I wanted to intervene and suggest they try both ways but that would have killed their discussion. The class discussed that idea during presentations. Why is there a 13 cent difference? Precision?

99.99  
 ↓  
 40%  
 99.99  
 - 39.99  
 -----  
 \* 60.00  
 - 7.55  
 -----  
 52.45  
 + 4.98  
 -----  
 57.43

57.43

Original Price = 99.99 rounded!  
 Tax = 9.5%  
 60.00 2c = 40% (10%)  
 - 7.55 tax  
 -----  
 52.45  
 + 4.86  
 -----  
 57.31  
 + 0.01  
 -----  
 57.32

57.32

There was another order to consider and related precision. Is it possible that the 22 cent difference is due to precision of decimals?

$\frac{25}{100} \times \frac{x}{99.99} = \frac{100 \times x}{100} = 2499.75$   
 $x = 24.9975$   
 $x \approx 25$   
 $\frac{15}{100} \times \frac{x}{67.45} = \frac{100 \times x}{100} = 1011.75$   
 $x = 10.12$   
 $57.33 + 5.45 = 62.78$

Collaborating Coupons

Save 25% Orig. 99.99	15% off \$7.55 off Tax = 9.5%
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25% of 99.99 = 24.75  
 99.99 - 24.75 = 75.24

15% of 67.69 = 10.1535  
 67.6900 - 10.1535 = 57.5365

9.5% of 57.5365 = 5.4659675  
 + 57.5365000  
 -----  
 63.0024675

\$63