Markup & Markdown Problems Worksheet

1. A store advertises that customers can take 25% off the original price and then take an extra 10% off. Is this the same as a 35% off discount? Explain.

2. An item that costs $\$50.00$ is marked 20% off. Sales tax for the item is 8%. What is the final price, including tax?

a) Solve the problem with the discount applied before the sales tax.

b) Solve the problem with the discount applied after the sales tax.

c) Compare your answers in parts (a) and (b). Explain.

3. The sale price for a bicycle is $\$315$. The original price was first discounted by 50% and then discounted an additional 10%. Find the original price of the bicycle.

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1. A store advertises that customers can take 25% off the original price and then take an extra 10% off. Is this the same as a 35% off discount? Explain.

No, because the 25% is taken first off the original price to get a new whole. Then, the extra 10% off is multiplied to the new whole. For example, $(1 - 0.25)(1 - 0.10) = 0.675$ or $(0.75)(0.90) = 0.675$. This is multiplied to the whole, which is the original price of the item. This is not the same as adding 25% and 10% to get 35% and then multiplying by $(1 - 0.35)$, or 0.65.

2. An item that costs $\$50.00$ is marked 20% off. Sales tax for the item is 8%. What is the final price, including tax?

a) Solve the problem with the discount applied before the sales tax.

$(1.08)(0.80)(50) = 43.20$. *The final price is* $\$43.20$.

b) Solve the problem with the discount applied after the sales tax.

$(0.80)(1.08)(50) = 43.20$. *The final price is* $\$43.20$.

c) Compare your answers in parts (a) and (b). Explain.

My answers are the same. The final price is $\$43.20$. *This is because multiplication is commutative.*

3. The sale price for a bicycle is $\$315$. The original price was first discounted by 50% and then discounted an additional 10%. Find the original price of the bicycle.

$(315 \div 0.9) \div 0.5 = 700$. *The original price was* $\$700$.