Module 4 Review

1. Your parents took your family out to dinner. Your parents wanted to give the waiter an 18% tip. The restaurant is located in a county where the sales tax is 6.5%. If the total amount of the dinner was $42.00 (before tax and tip), what is the new total after these are taken into consideration? Solve the problem using 2 different methods. Explain why these are equivalent.

   **Method 1:**
   
   \[(42)(0.065) = 2.73\]
   
   \[42 + 2.73 = 44.73\]
   
   \[44.73(0.18) = 8.05\]
   
   \[44.73 + 8.05 = 52.78\]

   **Method 2:**
   
   \[(42)(1.065) = 44.73\]
   
   \[44.73(1.18) = 52.78\]

   These are equivalent because Method 1 found the amount of the tax and tip and added these onto the previous total to get the new total. Method 2 adds the tax and the tip directly (similar to a markup where the percentage is added to 100%). They both arrive at the same answer.

2. A scientist took an experimental measurement and got 10.4 mL. The actual measurement was 9.7 mL. What is the percent error?

   \[
   \text{Percent error} = \frac{|a-x|}{x} \times 100
   \]
   
   \[\left(\frac{|10.4 - 9.7|}{9.7}\right) \times 100 = 7.2\%\]

   Another scientist took an experimental measurement of a different volume and got 58.5 mL. The actual measurement was 61.1 mL. What is the percent error?

   \[
   \text{Percent error} = \left(\frac{|58.5 - 61.1|}{61.1}\right) \times 100 = 4.3\%
   \]

   Explain why the first measurement, which was “off” by less had a larger percent error.

   **The first measurement is dealing with smaller quantities, so there is less room for error than in the second measurement which has larger quantities.**
3. Kelly deposits $350 into a savings account. The savings account accrues interest at a flat rate of 1.05% per month. How much will the account be worth in 7 months?

\[ I = Prt \]
\[ I = (350)(0.0105)(7) = 25.73 \]
Balance = Principal + Interest
Balance = 350 + 25.73 = $375.73

Miranda deposits $275 into a savings account that accrues interest at a flat rate of 1.30% per month. Whose account is worth more after 7 months, Miranda’s or Kelly’s?

\[ I = (275)(0.013)(7) = 25.03 \]
Balance = 275 + 25.03 = $300.03

Kelly’s is worth more

4. Evan sells skateboards in his store. He marks up the prices by 40% of what he pays for them. If he purchases a gold series skateboard for $128.92, how much will he charge for the skateboard in his store?

Selling price = \((1 + m)\)whole
Selling price = \((1 + 0.4)(128.92) = 180.49\)

He then has a spring sale and marks down the price for the same skateboard by 40%. Does he sell the skateboard for more or less than what he paid for it? Why isn’t the price the same as what he bought it for?

Selling price = \((1 – 0.4)(180.49) = 108.29\)

He sells the skateboard for less than what he paid for it. The price is not the same as what he bought it for because there is a different starting (whole) price.

4 possible reasons why a store may markup prices:

- Labor
- Advertising
- Supply/Demand
- Utilities (electricity, A/C, heating, water etc.)
- Transportation
- Rent/Mortgage