**Activity 5.7.2 Think before You Buy that Drink**

After completing Activity 1, you might be thinking that you spent a lot of time and effort doing calculations that showed only very small amounts of accrued interest. Remember the power of exponential growth comes with time. What happens when you start a regular savings plan and maintain it for a longer period of time?

**Situation:** Karina and Janelle are both celebrating their 18th birthday. Their celebration is stopping at their favorite coffee place and picking up a specialty drink on the way to school. As usual, it costs about $5 per drink. Karina and Janelle usually stop a couple of times per week to buy these specialty drinks.

Later that day, Karina and Janelle found themselves thinking back to Algebra 2 class and exponential growth. Karina wonders how much she can save if she eliminates two drinks per month and puts the $10 into a long term savings account. Janelle is not interested in giving up two drinks per month. Janelle tells her friend “I am not giving up my treat! I am young and not interested in putting away $10 a month. I’ll start that when I am old – maybe when I am 30!”

**Part 1:** Karina keeps thinking and decides to put her plan into action. She finds a long term account with a 4.2% annual interest rate compounded monthly. She begins depositing $10 at the end of each month.

1. How much money will be in the account when she turns 30?
2. How much of this did Karina actual deposit?
3. How much of the total is accrued interest?

**Part 2:** Janelle and Karina have lunch on their 30th birthday. Karina tells Janelle about her savings plan started 12 years ago. Karina’s goal is to eventually go on an extended tour of South America so she is going to continue saving at the same rate until she is 50. Janelle decides she will also start saving so she can accompany Karina on her trip. Janelle opens an account with a 4.2% annual interest rate compounded monthly but decides to deposit $15 monthly to help make up for lost time.

1. How much money will Karina have in her account when she turns 50?
2. From when she opened the account when she was 18, how much did Karina actually deposit? How much did she earn in interest?
3. How much money will Janelle have in her account when she turns 50?
4. How much did Janelle actually deposit? How much did she earn in interest?

**Part 3 - Challenge:** Janelle and Karina meet again for dinner on their 50th birthday. They decide to take their extended South American trip after retirement when they turn 67. Karina plans to leave her money in the same account with the same interest rate until she is 67. Janelle wants to have as much money in her account when she turns 67 as Karina will have. Janelle sets out looking for a new bank. Assuming she continues to deposit $15 per month, what interest rate approximately will she need to find in order to have the same amount of money as Karina on their 67th birthday?