1. Describe three factors that affect the amount of interest your money earns in a simple interest account.

   Time it is invested for.
   Interest rate.
   How much money you start with.

2. How can you use a fraction to express each time in years?  
   a) 6 months  
   b) 4 months  
   c) 9 months

   \[
   \frac{6}{12} = \frac{1}{2}, \quad \frac{4}{12} = \frac{1}{3}, \quad \frac{9}{12} = \frac{3}{4}, \quad 12 \text{ months in a year.}
   \]
3. What’s wrong? Kim deposits $100 into an account that pays 6% per year. Kim says, “Hey, if I leave this money in for 5 years, I’ll earn over $3000 in interest! Look. I worked it out.” Here is Kim’s calculation:

\[ I = P \times r \times t \]
\[ I = 100 \times 0.06 \times 5 \]
\[ I = 3000 \]

a) Find the error in Kim’s solution and show a correct one.
b) How can you tell Kim in a bad news/good news way about her mistake?

a) The rate “r” is 6% => 0.06 not 6.
\[ I = 100 \times 0.06 \times 5 \]
\[ I = 30 \]

b) Sorry Kim, it’s not $3000, but it is $30 which is better than nothing! ?!

4. Suppose you deposit $250 into an account for 2 years. The account earns 5% interest per year.

a) How much interest is earned in 2 years?
b) What does the deposit amount to after 2 years?

a) \[ I = P \times r \times t \]
\[ I = 250 \times 0.05 \times 2 \]
\[ I = 25 \]

b) \[ A = P + I \]
\[ A = 250 + 25 \]
\[ A = 275 \]

5. Kelly buys a $500 bond that matures in 4 years. The bond pays 6% interest per year.

a) Determine the total interest earned.
b) What is the value of the bond after 4 years?

a) \[ I = P \times r \times t \]
\[ I = 500 \times 0.06 \times 4 \]
\[ I = 120 \]

b) \[ A = P + I \]
\[ A = 500 + 120 \]
\[ A = 620 \]
6. Tom leaves a deposit of $420 in a savings account for 3 years. The account earns 4.5% interest per year.
   a) How much interest is earned in 3 years?
   \[ I = P \times r \times t \]
   \[ I = 420 \times 0.045 \times 3 \]
   \[ I = 56.70 \]
   b) How much does the deposit amount to after 3 years?
   \[ A = P + I \]
   \[ A = 420 + 56.70 \]
   \[ A = 476.70 \]

7. Pat deposits $325 into an account that earns 2.5% interest per year. Find
   a) the interest after 6 months
   \[ I = P \times r \times t \]
   \[ I = 325 \times 0.025 \times 0.5 \]
   \[ I = 4.06 \]
   b) the value of the deposit after 6 months
   \[ A = P + I \]
   \[ A = 325 + 4.06 \]
   \[ A = 329.06 \]

8. Cleo borrows $670 for 9 months. The loan company charges 12\(\frac{1}{2}\)% interest per year.
   a) How much interest does Cleo owe?
   \[ I = P \times r \times t \]
   \[ I = 670 \times 0.125 \times 0.75 \]
   \[ I = 62.81 \]
   b) How much will she need to pay off the loan after 9 months?
   \[ A = P + I \]
   \[ A = 670 + 62.81 \]
   \[ A = 732.81 \]

9. Suppose you borrow $200 from a friend.
   Your friend charges 9\(\frac{1}{2}\)% interest per year.
   You repay the loan after 3 months.
   a) How much interest will you have to pay?
   \[ I = P \times r \times t \]
   \[ I = 200 \times 0.095 \times 0.25 \]
   \[ I = 4.75 \]
   b) How much in total will you have to pay back?
   \[ A = P + I \]
   \[ A = 200 + 4.75 \]
   \[ A = 204.75 \]
10. You lend $1500 to a friend for 4 months, at an interest rate of $3\frac{3}{4}$% per year. What total amount will your friend have to pay back?

\[ I = P \times r \times t \]
\[ I = 1500 \times 0.0475 \times \frac{1}{3} \]
\[ I = $23.75 \]

\[ A = P + I \]
\[ A = 1500 + 23.75 \]
\[ A = $1523.75 \]

He needs to pay back $1523.75 in total.

11. Eric deposits $175 for 6 months into an account that pays 7% interest per year. He deposits $200, for 6 months, into another account that pays 4% interest per year. Which account will earn more interest? Explain how you know.

\[ I_A = P \times r \times t \]
\[ I_A = 175 \times 0.07 \times \frac{1}{2} \]
\[ I_A = $6.13 \]

\[ I_B = P \times r \times t \]
\[ I_B = 200 \times 0.04 \times \frac{1}{2} \]
\[ I_B = $4 \]

⇒ Account A will earn more interest.
12. Karen has $500 to invest for 4 years. Her bank offers two options.
Account A: earns 5.5% interest per year
Account B: earns \( \frac{3}{4} \times 5\)% interest per year

a) Account B (higher rate)

b) \( I_A = P \times r \times t \)
\( I_A = 500 \times 0.055 \times 4 \)
\( I_A = \$110 \)

\( I_B = P \times r \times t \)
\( I_B = 500 \times 0.0575 \times 4 \)
\( I_B = \$115 \)

\( \Rightarrow \) Extra interest = 115 - 110 = \$5

13. Suppose you purchase a $500 Canada Savings Bond that earns 5.4% interest per year.

a) What will the value of the bond be when it matures in 4 years?

b) If you cash in the bond after 3 years, the bank reduces the interest rate by 1%.
What is the value of the bond in this case?

a) \( I = P \times r \times t \)
\( I = 500 \times 0.054 \times 4 \)
\( I = \$108 \)
\( A = P + I \)
\( A = 500 + 108 \)
\( A = \$608 \)

b) \( I = P \times r \times t \)
\( I = 500 \times 0.044 \times 3 \)
\( I = \$66 \)
\( A = P + I \)
\( A = 500 + 66 \)
\( A = \$566 \)