Some Interest and Loan Practice Questions

Hint: Any time you read "simple interest" or are asked to estimate, you use the simple interest formula.

\[ I = \text{prt} \]

1. Estimate the simple interest for a $2000 investment at 3.55% for 2 years.

\[ I = \text{prt} \]
\[ I = 2000 \times 0.0355 \times 2 \]
\[ I = \$142.00 \]

2. Estimate the simple interest for a $3000 investment at 4 3/8% for three years.

\[ I = \text{prt} \]
\[ I = 3000 \times 0.045 \times 3 \]
\[ I = \$405 \]
3. Find the simple interest for a $100,000 investment at 2.75% for 8 months. Hint: Your time \( t \) is a fraction.

\[
T = \frac{100,000 \times 0.0275 \times \frac{8}{12}}{12} = \frac{100,000 \times 0.0275 \times 8}{12} = \$1833.33
\]

4. Find the simple interest for a $32,000 investment at 2.99% for sixteen months.

\[
T = \frac{32,000 \times 0.0299 \times 16}{12} = \frac{32,000 \times 0.0299 \times 16}{12} = \$1275.73
\]

5. Find the simple interest for a $2500 investment at 2.35% for one year.

\[
T = \frac{2500 \times 0.0235 \times 1}{1} = \frac{2500 \times 0.0235 \times 1}{1} = \$58.75
\]
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Hint: If the word compound is in the description of the problem, you must use the compound interest formula!

\[
A = P \left(1 + \frac{r}{n}\right)^{nt}
\]

6. What is the amount in your account at the end of 6 years on a $2500 investment at 15% interest if the interest is compounded monthly?

\[
A = P \left(1 + \frac{r}{n}\right)^{nt}
\]

\[
A = 2500 \left(1 + \frac{0.15}{12}\right)^{72}
\]

\[
2500 \left(1 + 0.0125\right)^{72}
\]

\[
2500 \left(1.0125\right)^{72}
\]

\[
2500 \left(1.44159\ldots\right)
\]

\[
\approx 6141.80
\]
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7. If you deposit $4000 into an account paying 3.15% interest compounded monthly, how much money will be in the account after 4 years?

\[ A = P \left( 1 + \frac{r}{n} \right)^{nt} \]
\[ A = 4000 \left( 1 + \frac{0.0315}{12} \right)^{48} \]
\[ A = \$4536.38 \]

8. If you deposit $6500 into an account paying 2.65% interest compounded monthly, how much money will be in the account after 2 years?

\[ A = P \left( 1 + \frac{r}{n} \right)^{nt} \]
\[ A = 6500 \left( 1 + \frac{0.0265}{12} \right)^{24} \]
\[ A = \$6853.39 \]
9. You deposited $10,000 into an account paying 3.65% interest, compounded annually. How much money will you have in your account after 18 years?

\[ p = 10,000 \]
\[ r = 0.0365 \]
\[ t = 18 \]

\[ 10,000 \left(1 + \frac{0.0365}{1}\right)^{18} \]

\[ \approx \$19,106.47 \]

10. What is the amount in your account at the end of one year on a $10,000 investment? The interest rate is 2.90% and is compounded quarterly.

\[ p = 10,000 \]
\[ r = 0.029 \]
\[ t = 1 \]
\[ n = 4 \]
\[ nt = 4 \]

\[ 10,000 \left(1 + \frac{0.029}{4}\right)^4 \]

\[ = 10,000 \left(1.00725\right)^4 \]

\[ \approx \$10,293.17 \]
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11. You want to buy a new car for $13,500. This price includes taxes. You have a finance rate of 6.25% for 4 years. This gives you a monthly payment of $318.60 per month. \((13500/1000 \times 23.60)\)

   a) Calculate the total amount you pay back to the bank.

   \[
   318.60 \times 12 \times 4 = \$15,292.80
   \]

   b) Calculate the total amount of interest paid.

   \[
   \begin{align*}
   15,292.80 - 13,500.60 &= \$1,792.20 \\
   \end{align*}
   \]

12. Use the loan payment table to find the monthly loan payment for a $2500 loan at 7% for 2 years.

   \[
   \frac{2500}{1000} \times 44.77 = \frac{25}{10} \times 44.77 = 111.93
   \]

13. Use the loan payment table to find the monthly loan payment for a $10,500 loan at 5.25% for 4 years.

   \[
   \frac{10,500}{1000} \times 23.26 = \frac{105}{10} \times 23.26 = \$2441.23
   \]
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14. Use the loan payment table to find the monthly loan payment for a $20,870 loan at 4.75% for 7 years.

\[
\frac{20,870 \times 14.02}{1000} = \$292.60
\]

15. You want to buy a new car for $14,000 plus PST and GST. You have $5000 in savings and will borrow the rest. You have a finance rate of 5.50% for 4 years. Organize your answer below, answering the following questions:

a) Calculate the total cost of the car including taxes.
b) Calculate the amount of money you will need to borrow.
c) Calculate your monthly loan payment.
d) Calculate the total cost of your car at the end of the 4 year loan.
e) How much extra money did you pay by getting a loan?

\[
a) \quad 14,000 \times 1.13 = \$15,820 \\
b) \quad \$15,820 - \$5000 = \$10,820 \\
c) \quad \frac{10,820}{1000} \times 23.24 = \$251.67 \\
d) \quad \$251.67 \times 4 \times 12 = \$12,080 \quad \text{principal paid back} \\
\quad + \quad 5,000 \\
\quad \$17,080 \quad \text{paid in total} \\
\]

\[
e) \quad \frac{-15,820}{12} = \text{extra paid in interest on } \$26.25 \text{ month in interest.}
\]