Solutions

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

12 months in a year.

a) $\frac{6}{12} = \frac{1}{2}$

b) $\frac{4}{12} = \frac{1}{3}$

c) $\frac{9}{12} = \frac{3}{4}$

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:

$$I = P \times r \times t$$
$$I = \$100 \times 6 \times 5$$
$$I = \$3000$$

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%
$\Rightarrow$ 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. $= 0.05$

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. $= 0.06$

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. $= 0.045$

a) How much interest is earned in 3 years?

b) How much does the deposit amount to after 3 years?

a) $I = P \times r \times t$

$I = 420 \times 0.045 \times 3$

$I = \$56.70$

b) $A = P + I$

$A = 420 + 56.70$

$A = \$476.70$

7. Pat deposits $325 into an account that earns 2.5% interest per year. Find $= 0.025$

a) the interest after 6 months $= 0.5$

b) the value of the deposit after 6 months

a) $I = P \times r \times t$

$I = 325 \times 0.025 \times 0.5$

$I = \$4.06$

b) $A = P + I$

$A = 325 + 4.06$

$A = \$329.06$

8. Cleo borrows $670 for 9 months. The loan company charges $12\frac{1}{2}\%$ interest per year. $= 0.125$

a) How much interest does Cleo owe?

b) How much will she need to pay off the loan after 9 months?

9 months $= \frac{9}{12} = \frac{3}{4}$

a) $I = P \times r \times t$

$I = 670 \times 0.125 \times 0.75$

$I = \$62.81$

b) $A = P + I$

$A = 670 + 62.81$

$A = \$732.81$

9. Suppose you borrow $200 from a friend. Your friend charges $9\frac{1}{2}\%$ interest per year. $= 0.095$ You repay the loan after 3 months.

a) How much interest will you have to pay?

b) How much in total will you have to pay back?

3 months $= \frac{3}{12} = \frac{1}{4}$

a) $I = P \times r \times t$

$I = 200 \times 0.095 \times 0.25$

$I = \$4.75$

b) $A = P + I$

$A = 200 + 4.75$

$A = \$204.75$

10. You lend $1500 to a friend for 4 months, at an interest rate of $4\frac{3}{4}\%$ per year. What total amount will your friend have to pay back?

$= \frac{4}{12} = \frac{1}{3}$

$4\frac{3}{4}\% = 4.75\% = 0.0475$

$I = P \times r \times t$

$I = 1500 \times 0.0475 \times \frac{1}{3}$

$I = \$23.75$

$A = P + I$

$A = 1500 + 23.75$

$A = \$1523.75$

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.

$= \frac{6}{12} = \frac{1}{2}$

$I_A = P \times r \times t$

$I_A = 175 \times 0.07 \times \frac{1}{2}$

$I_A = \$6.13$

$I_B = P \times r \times t$

$I_B = 200 \times 0.04 \times \frac{1}{2}$

$I_B = \$4$

$\Rightarrow$ 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 $5\frac{3}{4}$% interest per year

a) Which account should Karen invest in?

b) How much more interest does it pay than the other account?

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) $I = P \times r \times t$

$I = 500 \times 0.044 \times 3$

$I = \$66$

$A = P + I$

$A = 500 + 66$

$A = \$566$