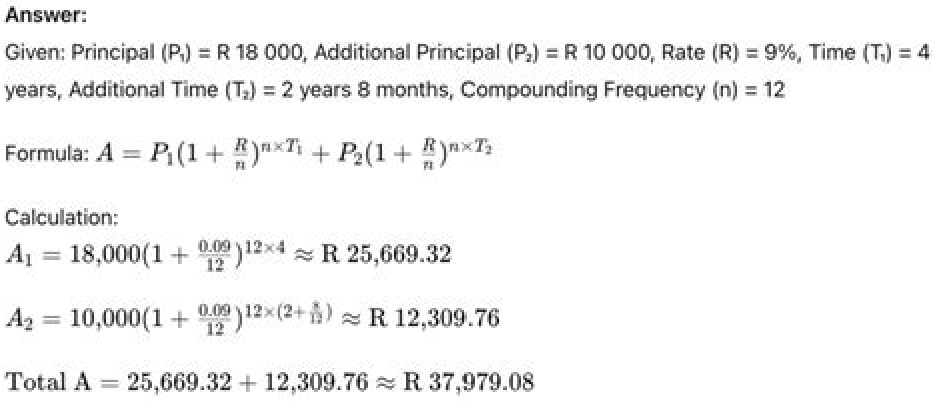
Grade 12 Financial Maths Questions And Answers



Answer:

Given: Principal (P_1) = R 18 000, Additional Principal (P_2) = R 10 000, Rate (R) = 9%, Time (T_1) = 4 years, Additional Time (T_2) = 2 years 8 months, Compounding Frequency (n) = 12

Formula: $A = P_1(1 + \frac{R}{n})^{n \times T_1} + P_2(1 + \frac{R}{n})^{n \times T_2}$

Calculation:

$A_1 = 18{,}000(1 + \frac{0.09}{12})^{12 \times 4} \approx \text{R } 25{,}669.32$

$A_2 = 10{,}000(1 + \frac{0.09}{12})^{12 \times (2 + \frac{8}{12})} \approx \text{R } 12{,}309.76$

$\text{Total A} = 25{,}669.32 + 12{,}309.76 \approx \text{R } 37{,}979.08$

Grade 12 financial maths questions and answers are essential for students preparing for their final exams and real-world financial literacy. Financial mathematics is a branch of applied mathematics concerned with financial markets and the management of financial resources. As students progress towards graduation, understanding financial concepts becomes critical. This article will explore various topics within financial mathematics relevant to grade 12 students, along with examples of questions and their answers to help reinforce learning.

Understanding Financial Mathematics

Financial mathematics encompasses a broad range of topics, from basic arithmetic to more complex calculations involving interest rates, investments, loans, and annuities. The following sections will delve into key areas of study.

1. Simple Interest

Simple interest is calculated on the principal amount, or initial investment, for a specified period at a fixed interest rate. The formula for simple interest is:

\[\text{SI} = P \times r \times t \]

Where:
- SI = Simple Interest
- P = Principal amount
- r = Rate of interest (as a decimal)
- t = Time (in years)

Example Question:
If you invest $1,000 at an annual interest rate of 5% for 3 years, how much interest will you earn?

Answer:
Using the formula:

$$\text{SI} = 1000 \times 0.05 \times 3 = 150$$

The simple interest earned is $150.

2. Compound Interest

Compound interest differs from simple interest in that it is calculated on the principal and also on the interest that has been added to the principal. The formula for compound interest is:

$$A = P \times (1 + r/n)^{nt}$$

Where:
- A = the amount of money accumulated after n years, including interest.
- P = Principal amount
- r = Annual interest rate (decimal)
- n = Number of times that interest is compounded per year
- t = Number of years the money is invested or borrowed

Example Question:
How much will $1,000 grow in 5 years if it is compounded annually at an interest rate of 4%?

Answer:
Using the formula:

$$A = 1000 \times (1 + 0.04/1)^{1 \times 5} = 1000 \times (1.04)^{5}$$

Calculating $(1.04)^{5} \approx 1.21665$:

$$A \approx 1000 \times 1.21665 \approx 1216.65$$

The total amount after 5 years will be approximately $1,216.65.

3. Present Value and Future Value

Understanding present value (PV) and future value (FV) is crucial for financial decision-making. The present value is the current worth of a sum of money that you will receive in the future, discounted back at a specific interest rate.

Formulas:
- Future Value: \(FV = PV \times (1 + r)^t \)
- Present Value: \(PV = \frac{FV}{(1 + r)^t} \)

Example Question:
What is the present value of $5,000 received in 3 years if the discount rate is 6%?

Answer:
Using the present value formula:

\[PV = \frac{5000}{(1 + 0.06)^3} \]

Calculating \((1.06)^3 \approx 1.191016 \):

\[PV \approx \frac{5000}{1.191016} \approx 4193.33 \]

The present value is approximately $4,193.33.

4. Annuities

An annuity is a series of payments made at equal intervals. There are two main types of annuities: ordinary annuities and annuities due.

Ordinary Annuity Formula:
\[A = P \times \left(\frac{(1 + r)^n - 1}{r}\right) \]

Example Question:
If you invest $200 at the end of each year for 5 years at an interest rate of 5%, what will be the total amount accumulated at the end?

Answer:
Using the formula for an ordinary annuity:

\[A = 200 \times \left(\frac{(1 + 0.05)^5 - 1}{0.05}\right) \]

Calculating \((1.05)^5 \approx 1.27628 \):

\[A = 200 \times \left(\frac{1.27628 - 1}{0.05}\right) \approx 200 \times \left(\frac{0.27628}{0.05}\right) \approx 200 \times 5.5256 \approx 1105.12 \]

The total amount accumulated will be approximately $1,105.12.

5. Loans and Mortgages

Understanding loans and mortgages is essential for any financial literacy.

The formula to calculate monthly payments on a loan is:

$$ M = P \times \frac{r(1 + r)^n}{(1 + r)^n - 1} $$

Where:
- M = Monthly payment
- P = Principal amount (loan)
- r = Monthly interest rate (annual rate divided by 12)
- n = Total number of payments (loan term in months)

Example Question:
Calculate the monthly payment on a $10,000 loan at an annual interest rate of 6% for 3 years.

Answer:
First, convert the annual rate to a monthly rate:

$$ r = \frac{0.06}{12} = 0.005 $$

Total number of payments:

$$ n = 3 \times 12 = 36 $$

Using the formula:

$$ M = 10000 \times \frac{0.005(1 + 0.005)^{36}}{(1 + 0.005)^{36} - 1} $$

Calculating $ (1.005)^{36} \approx 1.19668 $:

$$ M = 10000 \times \frac{0.005 \times 1.19668}{1.19668 - 1} \approx 10000 \times \frac{0.00598}{0.19668} \approx 10000 \times 0.0304 \approx 304.15 $$

The monthly payment will be approximately $304.15.

Conclusion

Mastering grade 12 financial maths questions and answers is crucial for students as they prepare for their examinations and future financial responsibilities. Understanding concepts such as simple and compound interest, present and future value, annuities, and loans equips students with the tools needed to make informed financial decisions.

By practicing various types of questions and familiarizing themselves with the associated formulas, students can enhance their problem-solving skills and develop a robust understanding of financial mathematics. This knowledge not only aids in academic success but also prepares students for real-world financial scenarios they will encounter in their lives.

As students continue to explore these topics, they should practice a variety of problems, ensuring they understand not just how to perform calculations but also the underlying principles that govern financial decision-making.

Frequently Asked Questions

What is the formula to calculate compound interest in grade 12 financial maths?

The formula to calculate compound interest is $A = P (1 + r/n)^{(nt)}$, where A is the amount of money accumulated after n years, including interest, P is the principal amount, r is the annual interest rate (decimal), n is the number of times that interest is compounded per year, and t is the number of years the money is invested or borrowed.

How do you calculate the present value of an investment?

The present value (PV) of an investment can be calculated using the formula $PV = FV / (1 + r)^t$, where FV is the future value of the investment, r is the interest rate per period, and t is the number of periods.

What is the difference between simple interest and compound interest?

Simple interest is calculated only on the principal amount, whereas compound interest is calculated on the principal and also on the accumulated interest from previous periods.

How can you determine the effective annual rate (EAR) from a nominal interest rate?

The effective annual rate (EAR) can be calculated using the formula $EAR = (1 + r/n)^{(nt)} - 1$, where r is the nominal interest rate, n is the number of compounding periods per year, and t is the number of years.

What is the importance of understanding loan amortization?

Understanding loan amortization is important because it helps borrowers know how much of their payment goes toward interest and how much reduces the principal, allowing them to better manage their finances and prepare for future payments.

How do you find the break-even point in a financial

scenario?

The break-even point can be found by using the formula Break-even point (in units) = Fixed Costs / (Selling Price per Unit - Variable Cost per Unit), which indicates the number of units that must be sold to cover all costs.

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