INTEREST

10 APRIL 2014

Lesson Description

In this lesson we

- Introduced and cover questions relating to:
  - Interest and Interest Rates
  - Simple Interest
  - Compound Interest
  - Hire Purchase Agreements
  - Interpreting and using tables showing compounded values

Summary

Interest Rate: - This is the percentage at interest is calculated.

Interest: - This is the actual monetary value of the loan.

Simple Interest

$$A = P(1 + i \times n)$$

Compound Interest

$$A = P(1 + i)^n$$

Where:

A = Amount with the calculated interest

P = Amount to be invested or the starting value

i = interest rate at the time of calculation

n = the number of times the interest is calculated

Hire Purchase = Deposit + (monthly instalments x number of months) + Monthly fee

Test Yourself

Question 1

Change 8,25% p.a. interest rate to a monthly interest rate.

A 8,25%

B 0,825%

C 0,6875%

D 99%

Question 2

Rounding your answer to 6 decimal places, calculate the daily interest rate on an annual interest rate of 6,38%.

A 0,531667%

B 0,017479%

C 0,0638%

D 0.063800%

Use the following when answering questions 3,4 and 5

A microwave is being sold for R799,00. Customers can buy this microwave on hire purchase by making a deposit of 15% and paying a monthly instalment of R43,00 for 2 years. The shop charge a monthly administration fee of R7,65.

Question 3

How much is required as a deposit?

A R120,00

B R679,15

C R119,85

D R799,00

Question 4

The total amount that the customer will need to pay each month is:

A R799,00

B R43,00

C R7,65

D R50,65

Question 5

The total amount paid for the microwave will be:

A R1 151,85

B R1 152,00

C R1 335,45

D R1 335,60

Question 6

Use the following sentence when answering questions 6,

An amount of R5000,00 is invested for 3 months at a compound interest rate of 4,5% per year.

Which formula would be used when answering this question?

A $A = P(1+i)^n$

B *A = P(1+i.n)*

C $P \times n \times i$

D Deposit + (monthly instalments x number of months) + Monthly fee

Question 7

What would you use as the value for i ?

A 4,5%

B 1,125%

C 0,045%

D 0,00375%

Question 8

What would you use as a value for n?

A 3

B $\frac{3}{12}$

C 12

D 0,03

Question 9

What would the value of P be in the formula?

A R5 000,00

B R5 056,46

C R12 998,05

D R5 705,83

Question 10

What would the value of A be in the formula?

A R5 000,00

B R5 056,46

C R12 998,05

D R5 705,83

Improve your Skills

Question 1

Consider the following formulae when answering this question which comprises of a set of multiple choice questions:

Formula 1 - $A = P(1+i)^n$

Formula 2 - *A = P(1+i.n)*

Formula 3 - *Interest* = $P \times n \times i$

On the day his son turns 19, a father went off to the bank and deposited R100 000,00 in a bank account that was offering 4,75% p.a. compound interest. Presume the interest rate remains unchanged and presume that the father leaves the R100 000,00 in the bank without depositing or withdrawing any money until the son turns 21 years old. As a 21st birthday present, the father withdraws all the money from the bank and gives the son the interest that was accumulated.

In each of the following, just write down the question number and the correct corresponding letter (e.g. 1.6 – D):

1.1 Which formula should one use when working with this problem? (1)

A: Formula 1

B: Formula 2

C: Formula 3

D: Neither

1.2 The R100 000,00 is represented by: (1)

A: P

B: A

C: *i*

D: *n*

1.3 4.75% is represented by: (1)

A: P

B: A

C: *i*

D: *n*

1.4 4,75% can also be written as: (1)

A: 475

B: 4,75

C: 0,475

D: 0,0475

1.5 The value for *n* is: (1)

A: R100 000,00

B: 3

C: 4,75

D: 2

1.6 The father will give the son: (3)

A: R 109 725,63

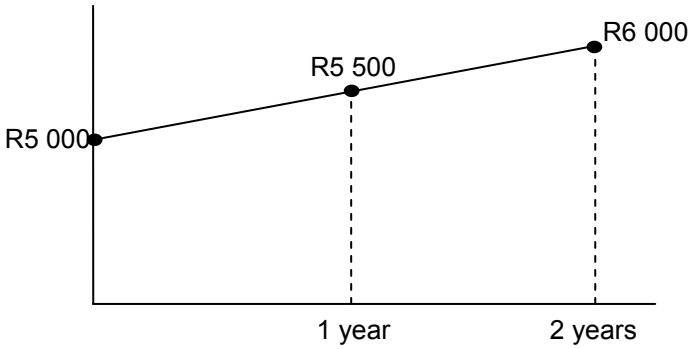
B: R 109 725,62

C: R 9 725,62

D: R 9 725,63

Question 2

Consider the following graph which shows an interest problem.



In each of the following, just write down the question number and the correct corresponding letter (eg. 1.6 – D):

1.1 Which formula should one use when working with this problem? (2)

Formula 1 - $A = P(1+i)^n$

Formula 2 - $A = P(1+i.n)$

Formula 3 - *Interest* = $P \times n \times i$

A: Formula 1

B: Formula 2

C: Formula 3

D: Could use 2 and 3

1.2 The value for A is: (2)

A: R 5 000

B: R 5 500

C: R 6 000

D: R 500

1.3 The value for P is: (2)

A: R 5 000

B: R 5 500

C: R 6 000

D: R 500

1.4 The interest earned is: (2)

A: R 500 a year

B: R 1 000 a year

C: 20% a year

D: 10 % a year

1.5 The interest rate is: (2)

A: R 500 a year

B: R 1 000 a year

C: 20% a year

D: 10 % a year

Question 3

Complete the following table:

Month	Amount in the account at the beginning of the month	Interest rate = 4,5%p.a per year compounded monthly	Amount in the account at the end of the month
1	R 20 000,00		
2			

Question 4

Complete the following table:

Day	Amount owing at the beginning of the day	Transaction	Balance after transaction	Interest at 0,021% per day	Balance owing at the end of the day
1	R 54.70	Deposit R2500			
2		Withdraw R500			

Question 5

Consider the following advert:

5.1 The cash price for the fridge is R3 293. Before the discount it was R3 799.

5.1.1 If one were buying the fridge for cash, what saving (in Rands) would one make? (2)

5.1.2 Using the formula below, determine the percentage discount, rounding to 2 decimal places. (4)

$$\text{Percentage Discount} = \frac{\text{Difference in Price}}{\text{Original Price}} \times 100$$

5.2 If one never had the cash to buy the fridge, how much would the fridge cost in total if buying it on Hire Purchase? (8)