

*Calculator Needed !*

### 3.1 Return on an Investment

In recent times, Banks have not offered attractive rates to savers and so placing large amounts of money in a Bank has become unattractive. If a Bank goes 'bust' a maximum of £85 000 in compensation can be claimed. Anything over that is likely to be lost.

Consequently, investing in property is regarded as more secure. Far higher rates of return than those offered by savings accounts are to be found (by those who know what they are doing) by investing in stocks and shares, or art, for example.

Of course such investments may need to be insured, lessening the return on the investment. Property can be rented out and so enhance the return.

### 3.2 Simple Interest

A finance company offers a fixed income saving account where a large amount of capital may be invested. At the end of each month a payment is made to the account holder of 0.4% of the capital held.

The capital may be withdrawn at any time, and the account closed.

George places one million pounds into such an account.

- ( i )      What is the amount paid to George by the account each month ?
  
- ( ii )      What is George's annual income from the account ?
  
- ( iii )      What is the Annual Percentage Rate (APR) paid by the account ?

### 3.3 Compound Interest

Jake opens a savings account with £4000.

It pays compound interest at 5 % per annum.

- ( i )      Calculate how much money is in Jake's account after each of the first three years.
  
- ( ii )      Show how Jake could quickly perform one calculation to determine how much money is in his account after three years.

### 3.4 Exercise

#### Question 1

I open a savings account with £4000.

Interest will be paid into the account at 4% per annum.

How much is in the account after 3 years ?

#### Question 2

I borrow £1000 from a friend.

He tells me I'm a "bad risk" and charges me 12% interest per annum.

How much do I owe my friend after 3 years ?

#### Question 3

I open a savings account with £5000.

Interest will be paid into the account at 3% per annum.

How much is in the account after 3 years ?

#### Question 4

I borrow £8000 on a credit card.

The rate charged is 26% interest per annum.

How much would I owe the credit card company after 3 years if no repayments were made during that time ?

Comment on the wisdom of borrowing money in this way.

#### Question 5

To decrease £8 by 15% first work out  $100\% - 15\%$

( O.K. That's 85%)

Now work out  $£8 \times 0.85$

**Question 6**

Decrease £24 by 15% using the method of question 5.

**Question 7**

Decrease £47 by 8% using the method of question 5.

**Question 8**

- ( i )      The Bank Of England is raising money by selling £1000 ten year government bonds. These guarantee to pay 8% interest per year but cannot be cashed for ten years.

Suppose you buy one of these £1000 bonds.

Calculate its value in ten years time by working out.....

$$Value = 1000 \times 1.08^{10}$$

- ( ii )      Similar £1000 Bonds issued ten years ago, were sold at a rate of 13.5%  
How much is one of those bonds now worth ?

**Question 9**

A man buys £4000 worth of shares in "Ye Trusty School Sweet Shop".

During the first year the value of the shares increases by 30%.

- ( i )      How much are the shares worth after that first year ?

The following year the value of the shares falls by 30%

- ( ii )      Calculate how much the shares are then worth, and show that this is not £4000.

- ( iii )      Over the two year period, were the shares a good investment ?

When buying shares they often come with a warning that the value of the shares can go down as well as up !

**Question 10**

At “Honest Joe's” electrical store a Microsoft Surface™ is priced at £400.  
It is sold to a customer at a discount of 20%.

( i )      What was the price the customer paid ?

Later, the customer sells the Microsoft Surface™ to a friend, making a profit of 20%.

( ii )      How much did the friend pay for the Microsoft Surface™ ?

( Note that the answer is NOT £400 )

**Question 11**

In the early 1980s, teachers, policemen and nurses got some big pay increases.  
Work out the new salary of the following;

( i )      A teacher on £6040 a year who gets a 28% pay increase.

( ii )      A policeman on £7124 a year who gets a 16% pay rise.

( iii )      A nurse who gets £5207 a year and a 38% pay rise.

( iv )      Who has the highest salary after the pay increases ?

**Question 12**

In 2012 University tuition fees of £3000 were increased to £9000.  
What is this increase when expressed as a percentage ?

**Question 13**

In June 2019 the UK's National Savings and Investments offered an income bond that paid interest as an income at a rate of 0.11% per month on the capital invested. The capital invested was 100% protected by the UK Treasury as investors are, in effect, lending money to the UK Government.

The maximum investment per customer was one million pounds.

- ( i )      What is the monthly income generated from a one million pound investment ?
  
- ( ii )      What is the annual income generated from a one million pound investment ?
  
- ( iii )      In June 2019 the annual rate of inflation was 2.1%.  
Is this more or less than the annual percentage rate on the return from the investment in an Income Bond ?
  
- ( iv )      Explain what your part ( iii ) answer is telling you about keeping money with the UK's national Savings and Investments Income Bond scheme.

**Question 14**

*GCSE Examination Question from Paper 1H, May 2019, Q8*

On 1<sup>st</sup> January 2016 Li bought a boat for \$170 000

The value of the boat depreciates by 8% per year

Work out the value of the boat on 1<sup>st</sup> January 2019

Give your answer correct to the nearest dollar.

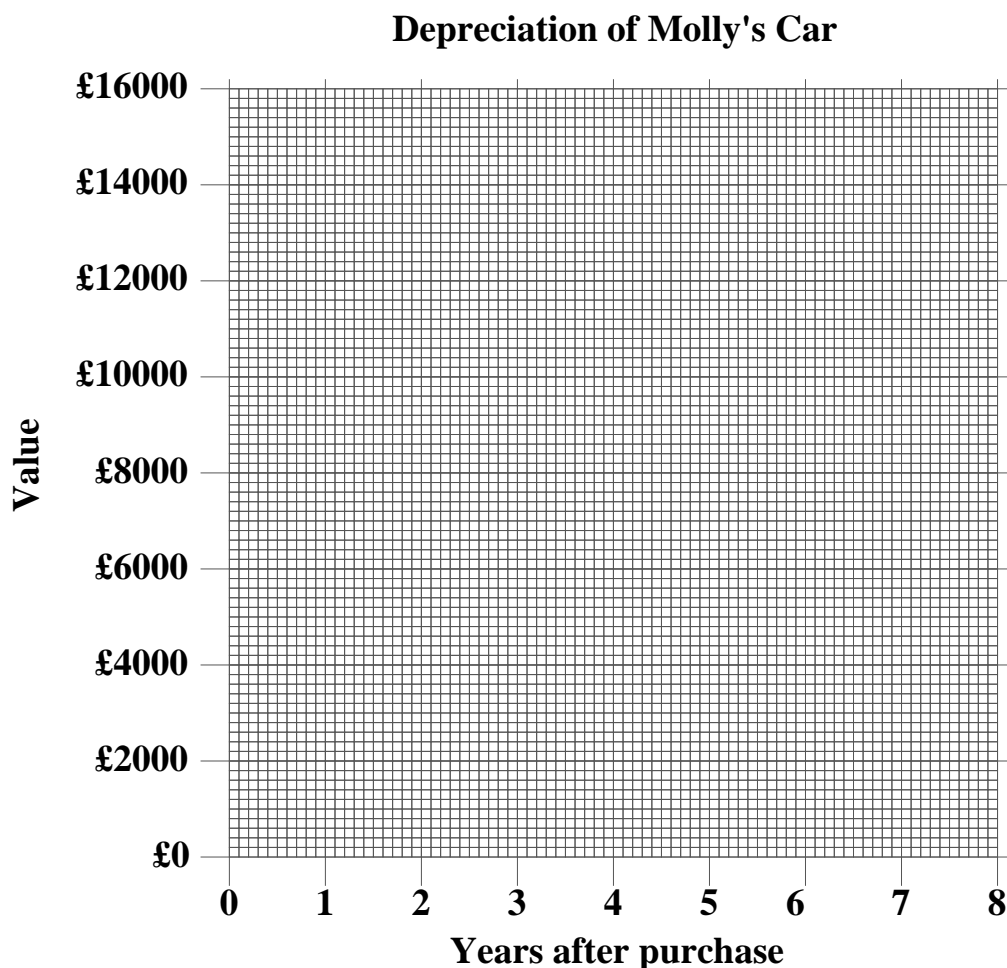
[ 3 marks ]

### Question 15

Molly buys a car for £14 000

The car is likely to depreciate at a rate of 28 % per annum.

- ( i )      How much is the car likely to be worth in one years time ?
  
- ( ii )     How much has the value of the car gone down by in that first year ?
  
- ( iii )    How much is the car likely to be worth in four years time ?
  
- ( iv )    After how many years is the car likely to be approximately worth £1000 ?
  
- ( v )    Plot a graph to show how the value of the car falls with time.



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Teachers may obtain detailed worked solutions to the exercises by email from [MHHShrewsbury@Gmail.com](mailto:MHHShrewsbury@Gmail.com)