

Compound Interest and Depreciation

Mark Scheme

Level	GCSE
Subject	Maths
Exam Board	Edexcel GCSE
Topic	Compound Interest and Depreciation
Grade Level	Grade 4
Booklet	Mark Scheme

Time Allowed: 42 minutes

Score: /35

Percentage: /100

Grade Boundaries:

$$100\% + 4\% = 104\%$$

1. Toby invested £4500 for 2 years in a savings account.
He was paid 4% per annum compound interest.

How much did Toby have in his savings account after 2 years?

$$4500 \times 1.04^2$$

£4867.20
(Total 3 marks)

2. The value of a car depreciates by 35% each year.

At the end of 2007 the value of the car was £5460

$$100\% - 35\% = 65\%$$

Work out the value of the car at the end of 2006

$$5460 \div 0.65 = 8400$$

£
(Total 3 marks)

3. Mario invests £2000 for 3 years at 5% per annum **compound** interest.

Calculate the value of the investment at the end of 3 years.

$$2000 \times 1.05^3$$

$$\text{£} \dots 2315.25 \dots$$

(Total 3 marks)

4. Derek invests £154 500 for 2 years at 4% per year compound interest.

Work out the value of the investment at the end of 2 years.

$$154500 \times 1.04^2$$

$$\text{£} \dots 167107.20 \dots$$

(3)

(Total 3 marks)

5. Henry invests £4500 at a compound interest rate of 5% per annum.

At the end of n complete years the investment has grown to £5469.78.

Find the value of n .

$$4500 \times 1.05^3 = 5209.31$$

$$4500 \times 1.05^4 = 5469.78$$

.....4.....
(Total 2 marks)

6. A company bought a van that had a value of £12 000
Each year the value of the van depreciates by 25%.

Work out the value of the van at the end of three years.

$$12000 \times 0.75^3 = 5062.50$$

£ 5062.50
.....
(3)
(Total 3 marks)

7. Bill invests £500 on 1st January 2004 at a compound interest rate of $R\%$ per annum.

The value, £ V , of this investment after n years is given by the formula

$$V = 500 \times (1.045)^n$$

- (a) Write down the value of R .

$$R = \dots\dots\dots 4.5 \dots\dots\dots \quad (1)$$

- (b) Use your calculator to find the value of Bill's investment after 20 years.

$$\begin{aligned} 500 \times 1.045^{20} \\ = 1205.86 \end{aligned}$$

$$\begin{aligned} \text{£} \dots\dots\dots 1205.86 \dots\dots\dots \\ (2) \\ \text{(Total 3 marks)} \end{aligned}$$

8. Gwen bought a new car.
Each year, the value of her car depreciated by 9%.

Calculate the number of years after which the value of her car was 47% of its value when new.

~~1.09~~

$$0.91^3 = 0.753571$$

$$0.91^4 = 0.68574961$$

$$0.91^5 = 0.6240321451$$

$$0.91^6 = 0.567869252$$

$$0.91^7 = 0.5167610194$$

$$0.91^8 = 0.47025$$

8

(Total 3 marks)

9. Liam invests £6200 for 3 years in a savings account.
He gets 2.5% per annum compound interest.

How much money will Liam have in his savings account at the end of 3 years?

$$6200 \times 1.025^3$$
$$= 6676.72$$

£6676.72.....

(Total 3 marks)

10. Toby invested £4500 for 2 years in a savings account.
He was paid 4% per annum compound interest.

(a) How much did Toby have in his savings account after 2 years?

$$\text{£ } \frac{4867.20}{(3)}$$

Jaspir invested £2400 for n years in a savings account.
He was paid 7.5% per annum compound interest.

At the end of the n years he had £3445.51 in the savings account.

(b) Work out the value of n .

$$\begin{aligned} 2400 \times 1.075^4 &= 3205.13 \\ 2400 \times 1.075^5 &= 3445.51 \end{aligned}$$

$$\frac{5}{(2)}$$

(Total 5 marks)

*11 Viv wants to invest £2000 for 2 years in the same bank.

The International Bank
Compound Interest
4% for the first year
1% for each extra year

The Friendly Bank
Compound Interest
5% for the first year
0.5% for each extra year

At the end of 2 years, Viv wants to have as much money as possible.

Which bank should she invest her £2000 in?

$$2000 \times 1.04 \times 1.01$$

$$= £2100.80$$

$$2000 \times 1.05 \times 1.005$$

$$= £2110.5$$

Viv should invest her money in The Friendly Bank.

(Total 4 marks)