

## Compound Interest and Depreciation Past Paper Questions



**Q1.**

Charlie invests £1200 at 3.5% per annum compound interest.

Work out the value of Charlie's investment after 3 years.

£.....

**(Total for Question is 3 marks)**

**Q2.**

Toby invested £7500 for 2 years in a savings account.

He was paid 4% per annum compound interest.

How much money did Toby have in his savings account at the end of 2 years?

£.....

**(Total for question is 2 marks)**

**Q3.**

Toby invested £7500 for 2 years in a savings account.

He was paid 4% per annum compound interest.

How much money did Toby have in his savings account at the end of 2 years?

£.....

**(Total for question is 2 marks)**



**Q4.**

Franz invests £2500 for 2 years at  $3\frac{1}{2}\%$  per annum compound interest.

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

£ .....

**(Total for question = 3 marks)**

**Q5.**

Bill wants to increase 150 by 3%

He writes down

$$150 \times 1.3 = 195$$

Bill's method is wrong.

(a) Explain why.

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.....

**(1)**

Sally wants to decrease 150 by 3%

(b) Complete this statement to show how Sally can decrease 150 by 3%

$$150 \times \dots = \dots$$

**(1)**

**(Total for question = 2 marks)**



**Q6.**

Northern Bank has two types of account.  
Both accounts pay compound interest.

<p><b>Cash savings account</b> Interest 2.5% per annum</p>
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<p><b>Shares account</b> Interest 3.5% per annum</p>
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Ali invests £2000 in the cash savings account.  
Ben invests £1600 in the shares account.

(a) Work out who will get the most interest by the end of 3 years.  
You must show all your working.

(4)

In the 3rd year the rate of interest for the shares account is changed to 4% per annum.

(b) Does this affect who will get the most interest by the end of 3 years?  
Give a reason for your answer.

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.....  
.....

(1)

**(Total for question = 5 marks)**



**Q7.**

Katy invests £200 000 in a savings account for 4 years.  
The account pays compound interest at a rate of 1.5 % per annum.  
Calculate the total amount of interest Katy will get at the end of 4 years.

£ .....

**(Total for question = 3 marks)**

**Q8.**

Ella invests £7000 for 2 years in an account paying compound interest.  
In the first year, the rate of interest is 3%  
In the second year, the rate of interest is 1.5%  
Work out the value of Ella's investment at the end of 2 years.

£ .....

**(Total for question = 3 marks)**



**Q9.**

The population of a city increased by 5.2% for the year 2014

At the beginning of 2015 the population of the city was 1 560 000

Lin assumes that the population will continue to increase at a constant rate of 5.2% each year.

- (a) Use Lin's assumption to estimate the population of the city at the beginning of 2017  
Give your answer correct to 3 significant figures.

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(3)

- (b) (i) Use Lin's assumption to work out the year in which the population of the city will reach 2 000 000

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- (ii) If Lin's assumption about the rate of increase of the population is too low, how might this affect your answer to (b)(i)?

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.....  
.....

(3)

**(Total for question = 6 marks)**



**Q10.**

Neil bought a house for £235 000

In the first year the value of the house depreciated by 4%

In each of years 2 and 3 the value of the house increased by 6%

Work out the value of the house at the end of year 3

£ .....

**(Total for question = 3 marks)**

**Q11.**

Anil wants to invest £25000 for 3 years in a bank.

<p><b>Personal Bank</b> Compound Interest 2% for each year</p>
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<p><b>Secure Bank</b> Compound Interest 4.3% for the first year 0.9% for each extra year</p>
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Which bank will give Anil the most interest at the end of 3 years?  
You must show all your working.

**(Total for question = 3 marks)**



**Q12.**

Natalia pays £13 995 for a car.  
Lauren pays £14 495 for a car.

Assume that

the rate of depreciation for Natalia's car is 12% per annum  
and the rate of depreciation for Lauren's car is 13% per annum.

- (a) Work out whose car will have the greater value at the end of 3 years.  
You must show all your working.

(4)

The rate of depreciation assumed for Natalia's car was too low.

- (b) How does this affect the value of her car at the end of 3 years?

.....  
.....

(1)

**(Total for question = 5 marks)**

**Q13.**

The value of a car depreciates by 25% each year.  
At the end of 2013 the value of the car was £4800  
Work out the value of the car at the end of 2015

£ .....

**(Total for Question is 3 marks)**



**Q14.**

Martin bought a computer for £1200

At the end of each year the value of the computer is depreciated by 20%.

After how many years will the value of the computer be £491.52?

You must show your working.

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**(Total for Question is 3 marks)**

**Q15.**

Becky buys a new car for £20 000

The value of this car will depreciate

by 15% at the end of the first year  
then by 10% at the end of every year after the first year.

After how many years will the car have a value of less than £15 000?

You must show all your working.

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**(Total for Question is 4 marks)**





**Q16.**

A ball fell 2 metres onto horizontal ground.

The ball hit the ground and bounced up and down 3 times.

The first time the ball bounced, it rose to 75% of the height it fell from.

The second time the ball bounced, it rose to 75% of the height it reached after the first bounce.

The third time the ball bounced, it rose to 75% of the height it reached after the second bounce.

Work out the height the ball reached after the third bounce.

Give your answer correct to 2 decimal places.

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**(Total for question = 3 marks)**

**Q17.**

Jean invests £12 000 in an account paying compound interest for 2 years.

In the first year the rate of interest is  $x\%$

At the end of the first year the value of Jean's investment is £12 336

In the second year the rate of interest is  $\frac{x}{2}\%$

What is the value of Jean's investment at the end of 2 years?

£ .....

**(Total for question = 4 marks)**



**Q18.**

The number of fish in a lake decreases by  $x$  % each year.

Given that the number of fish halves in 8 years, work out the value of  $x$ .

Give your answer correct to 1 decimal place.

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**(Total for question = 3 marks)**