Name:

Exam Style Questions

Compound Interest

Corbettmaths

Equipment needed: Pen and Calculator

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Video Tutorial

www.corbettmaths.com/contents

Video 236

Answers and Video Solutions

1. Sebastian leaves £3000 in the bank for two years.
It earns compound interest of 2% per year.

Calculate the total amount Sebastian has in the bank at the end of the two years.

1st year

2% of £3000 = £60

£3060

2nd year

2% of 3060 = £61.20

£3121.20

£ 3121.20

(2)

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2. Fiona leaves £1600 in the bank for four years.
It earns compound interest of 4% each year.

Calculate the total amount Fiona has in the bank at the end of the four years.

$1600 \times 1.04^4 = £1871.77$

£ 1871.77

(3)

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3. A car was bought for £18000.
Its value depreciated by 15% each year for the first three years.

What was its value at the end of the three years?

$18000 \times 0.85^3 = 11054.25$

£ 11054.25

(3)

4. Sally bought a piano for £2200.
In each year the value of the piano increases by 11% of its value at the start of that year.

(a) Find the value of the piano after one year.

$2200 \times 1.11 = 2442$

£ 2442
(2)

(b) Calculate after how many complete years the value of the piano will be at least £3200.

1 year $2200 \times 1.11 = 2442$
2 years $2200 \times 1.11^2 = 2710.62$
3 years $2200 \times 1.11^3 = 3008.7882$
4 years $2200 \times 1.11^4 = 3339.75...$

4 years
(2)

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5. Natalie invests £600 for 2 years at 10% per year compound interest.
How much interest does she earn?

1st year
10% of 600 = 60
£660

2nd year
10% of 660 = 66
£726

$726 - 600 = 126$

£ 126
(2)

6. Margot buys a new boat.

The value of the boat, £V, is given by the formula

$$V = 48000 \times 0.88^t$$

where t is the age of the boat in years.

(a) Write down how much the boat cost Margot.

£ 48000

(1)

(b) Write down the annual percentage decrease in value of the boat.

12 %

(1)

Margot plans to sell the boat when it is 10 years old.

(c) How much should Margot receive for the boat?

48000×0.88^{10}

13368.04685

£ 13368.05

(2)

or £13368.04

7. Jenny invests £400 for two years at 5% compound interest, paid yearly.
Tim says that the interest Jenny will receive will be £40.

Is Tim right? No
Explain your answer.

First year 5% of 400 = £20
Second year 5% of 420 = £21
+
£41

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She earns £41 interest.

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(3)

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8. A bank has an investment account that pays compound interest at a rate of 4.25% per annum.

Mrs Kennedy invests £2400

Work out how much her investment is worth after 8 years.

2400×1.0425^{8}

$= 3348.26...$

£ 3348.26

(2)

9. When a tennis ball is dropped, it bounces and then rises.

The ball rises to 60% of the height from which it is dropped.
The ball is dropped from a height of 2 metres.

(a) Calculate the height of the rise after the first bounce.

2×0.6

1.2 .....m
(1)

(b) Calculate the height of the rise after the second bounce.

1.2×0.6

0.72 .....m
(1)

The ball carries on bouncing, each time rising to 60% of the last rise.

(c) For how many bounces does it rise to a height greater than 20cm?
Show your working

1 bounce → 1.2m
2 bounces → 0.72m
3 bounces → 0.432m (2×0.6^3)
4 bounces → 0.2592m (2×0.6^4)
5 bounces → 0.15552m (2×0.6^5)

4 bounces .....
(2)

10. The number of people living on a remote island is expected to decrease by 2% each year.

The population of the island is 28000

Work out the expected population of the island after 6 years.

$28000 \times 0.98^6 = 24803.58666$

24804
or
24803

.....

(3)

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11. The value of a television was £600 on 1st March 2025.
Every four months, the value of the television decreased by 8% of its value at the start of that four months.

What was the value of the television on 1st March 2026? 1 year = 3 lots of 4 months

$600 \times 0.92^3 = 467.2128$

£ 467.21

.....

(3)

12. £5200 is invested at 2.8% compound interest per annum.
Work out how many years will it take for the investment to exceed £7000

$5200 \times 1.028^{10} = 6853.84834$

$5200 \times 1.028^{11} = 7045.75...$

11 .....years

(3)

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13. Barnaby bought a new motorbike for £30000

He believes that its value will depreciate by 25% each year.

(a) What should the value of his motorbike be after two years?

30000×0.75^2

£ 16875

(3)

For the model of motorbike Barnaby bought, it actually depreciates by 22% each year.

(b) How does that affect the answer to part (a)?

The value of his motorbike after 2 years will increase from £16875 if the depreciation is less.

(1)

14. Sian invests £8000 for 4 years in a savings account that pays compound interest.

In the first year, the interest rate is 6%
For every other year, the interest rate is 2.5%

Work out how much money is in the account at the end of the 4 years.

$8000 \times 1.06 = 8480$

$8480 \times 1.025^3 = 9132.0325$

£ 9132.03

(4)

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15. A radioactive substance decays over time.
Every year its mass decreases by 14%.

How many years will it take for 500kg of the substance to decay to a mass less than 200kg?

$500 \times 0.86^6 = 202.28...$

$500 \times 0.86^7 = 173.96...$

7 years

(3)

16. It takes James 100 minutes to run a distance.
His target was to run the distance in less than 80 minutes.

With training, he expects his time to decrease by 3% each month.

Does he expect to achieve his target after six months?
Show your workings.

$100 \times 0.97^6 = 83.297...$

No, he will not.

(3)

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17. Sophie invests £400 in a savings account that pays 3.5% compound interest per year.

Sophie wants to earn at least £500 interest.

Work out how many years this will take.

$400 + 500 = 900$

$400 \times 1.035^{22} = 852.604...$

$400 \times 1.035^{23} = 882.44...$

$400 \times 1.035^{24} = 913.33...$

24 years

(3)

18. Aurora wants to invest £500
She has two options, Bank World or Bank Universe.

Bank World	Bank Universe
8% compound interest per year	9% simple interest per year

Which bank is the best choice if Aurora wants to invest her money for 4 years?
You must show your working.

Bank World

500 × 1.08 = £680.24

Bank Universe

9% of 500 = £45

45 × 4 = £180

£500 + £180 = £680

Bank World

(4)

19. Kelly and Tim invest £6000 for 5 years.

Banks'R'Us	Corbett Bank
3% compound interest per year	Compound Interest 11% for the first year 0.9% for additional years

Kelly invests her money in Banks'R'Us.
Tim invests his money in Corbett Bank.

Who will have the most money at the end of 5 years?
You must show all your working.

Banks 'R' Us

$6000 \times 1.03^5 = £6955.64$

Corbett Bank

$6000 \times 1.11 = £6660$

$6660 \times 1.009^4 = £6903.02$

Kelly has mae money (4)

20. Martyn has some money to invest and sees this advert.

Bank of Maths

Double your money in 15 years.

The average annual growth for your investment is 4.5%

Will Martyn double his money in 15 years by investing his money with "Bank of Maths?"

You **must** show your workings.

$100 \times 1.046^{15} = 193.5288...$

No, it will not quite double.

(4)

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21. Finn invests £8000 into a savings account that will pay x% compound interest over the next 3 years.

After 3 years, Finn has £9200 in his savings account.

Work out the value of x.
Give your answer to 2 decimal places.

$8000 \times y^3 = 9200$

$y^3 = 1.15$

$y = 1.047689...$

4.77 %

(3)

22. A fish tank has sprung a leak, at the base of the tank.
5% of the water is lost every minute.

How much water is lost from the tank after ten minutes?

$100 \times 0.95^{10} = 59.873...$

$100 - 59.87369... = 40.1263...$

40.1263%

(3)

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23. Cathal invested £7000 in a savings account that pays a constant rate of compound interest.

After two years, there was £8316.70 in the account.

Work out how much money there will be in the account after 3 years.

$7000 \times y^2 = 8316.70$

$y^2 = 1.1881$

$y = 1.09$

$7000 \times 1.09^3 = 9065.203$

£ 9065.20

(3)