Name:

Exam Style Questions

Compound Interest

Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

Revision for this topic

www.corbettmaths.com/contents

Video 236

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)

---

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)

---

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.

2200×1.11

£ 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)

---

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

£ 126
(2)

726
− 600
126

6. 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

She earns £41 interest

(3)

---

7. 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 (2×0.6^3) → 0.432m
4 bounces (2×0.6^4) → 0.2592m
5 bounces (2×0.6^5) → 0.15552m

4 bounces .....

(2)

8. The value of a television was £600 on 1st March 2013.
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 2014? 1 year = 3 lots of 4 months

$600 \times 0.92^3 = 467.2128$

£ 467.21

(3)

---

9. £5200 is invested at 2.8% compound interest per annum.
How many years will it take for the investment to exceed £7000.

$5200 \times 1.028^6 = 6137.083491$

$5200 \times 1.028^8 = 6485.57164$

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

$5200 \times 1.028^{11} = 7045.756093$

11 years

(3)

10. 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?

$500 \times 0.86^5 = 235.21\ldots$

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

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

7 .....years

(3)

---

11. 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.

If Martin had £100

$100 \times 1.045^{15} = £193.53$

He will not double his money in 15 years with 4.5% interest

(4)

12. James weighed 100kg.
His target was to weigh 80kg or less.
His weight decreased by 3% each month.

Has he achieved his target after six months?
Show your workings.

$100 \times 0.97^6 = 83.2972\text{kg}$

No, he will not.

(3)

---

13. 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?

Initial = 100% (100)

$100 \times 0.95^{10} = 59.8737\%$ left in the tank.

$100 - 59.8737 = 40.1263\%$ lost

40.1263%

(3)