

Compound Interest, Growth and Decay

For AQA GCSE Mathematics (8300) • Higher tier

Name _____

Total marks: **28**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method. You may use a calculator.

- 1** £2000 is invested for 5 years at 3% compound interest per year.
Circle the calculation for the value of the investment after 5 years.

[1 mark]

2000×1.3^5

$2000 \times 1.03 \times 5$

2000×1.03^5

2000×0.03^5

- 2** A population of bacteria doubles every hour.
At the start there are 800 bacteria.
Circle the expression for the number after n hours.

[1 mark]

$800 + 2n$

$800 \times 2n$

800×2^n

800^{2n}

- 3** £5000 is invested at 3% compound interest per year.
Work out the value of the investment after 4 years.

[3 marks]

Answer £ _____

- 4** A van is bought for £18 500
Its value depreciates by 12% each year.
Work out its value after 4 years.

[3 marks]

Answer £ _____

- 5** Maya invests £5000 for 3 years in an account paying 4% compound interest per year.
Nell invests £5000 for 3 years in an account paying simple interest.
At the end of the 3 years they have both earned the same amount of interest.
Work out the rate of simple interest per year that Nell gets.
Give your answer to 2 decimal places.

[4 marks]

Answer _____ %

- 6** The number of members of a gym increases by 5% in the first year and by 15% in the second year.
Kat says,
“Over the two years, the number of members has increased by 20%.”
Is she correct?
You must show your working.

[3 marks]

☐ Yes

☐ No

- 7 The value of an antique clock increases by the same percentage each year.
At the end of 2021 it was worth £1600
At the end of 2023 it was worth £1764
Work out its value at the end of 2026

[3 marks]

Answer £ _____

- 8 An investment of £2000 earns compound interest at $r\%$ per year.
After 2 years it is worth £2163.20
Work out the value of r .

[3 marks]

Answer $r =$ _____

- 9 The number of birds on an island is decreasing by 10% each year.
There are 64 birds now.
After how many years will there first be fewer than 40 birds?

[3 marks]

Answer _____ years

- 10** The population of a city is now 8 400 000
The population is predicted to
 increase by 2% per year for 3 years
and then
 decrease by 1.5% per year for 2 years.
Work out the predicted population of the city 5 years from now.
Give your answer to 3 significant figures.

[4 marks]

Answer _____