

GCSE Maths: Compound interest, growth and decay (Higher): worksheet

GCSE Maths - Percentages - Higher - Lesson 5.8

Name: _____

Date: _____

Score: _____

20 questions. Write your answers in the spaces. Answers and step-by-step help are free at websink.site/gcse/maths/ch05-percentages/higher/compound-interest-growth-and-decay/

Exercise 5M Compound interest, growth and decay Calculator allowed

1 Work out the total amount in each case. Give your answers to the nearest penny.

(a) £1,000 at 5% per year for 2 years

Answer:

(b) £2,000 at 3% per year for 3 years

Answer:

(c) £5,000 at 4% per year for 2 years

Answer:

(d) £800 at 2% per year for 3 years

Answer:

(e) £1,500 at 6% per year for 2 years

Answer:

(f) £10,000 at 1.5% per year for 4 years

Answer:

2 Work out the compound interest earned in each case.

(a) £4,000 at 2.5% per year for 2 years

Answer:

(b) £6,000 at 3% per year for 2 years

Answer:

(c) £2,500 at 4% per year for 3 years

Answer:

3 Eve invests £3,000 for 3 years at 4% compound interest per year.

(a) Work out the total amount at the end of 3 years.

Answer:

(b) Work out the compound interest she earns.

Answer:

4 Hiba invests £2,000 for 3 years at 4% per year. Work out how much more interest she gets if the interest is compound interest rather than simple interest.

Answer:

- 5** A town has a population of 25,000. It grows by 3% each year. Work out the population after 4 years, to the nearest whole number.
Answer:
- 6** A scientist starts with 500 bacteria. The number of bacteria increases by 20% every hour. Estimate the number after 5 hours, to the nearest whole number.
Answer:
- 7** A car is worth £14,000 when new. It loses 15% of its value every year.
- (a) Work out the value of the car after 3 years.
Answer:
- (b) Work out the value of the car after 5 years.
Answer:
- 8** A new phone costs £800. It loses 25% of its value each year. Work out its value after 2 years. Work year by year.
Answer:
- 9** Joe says, "£1,000 at 10% compound interest for 2 years gives the same as 20% simple interest, because $10\% + 10\% = 20\%$." Is he right? Work out both totals.
Answer:
- 10** Dan wants to work out the value of £1,000 after 3 years at 5% compound interest. He writes: $1,000 \times 1.15 = £1,150$. Explain his mistake and work out the correct value.
Answer:
- 11** Work out each amount. Give your answers to the nearest penny or nearest whole number as appropriate.
- (a) £8,500 at 2.8% compound interest per year for 6 years
Answer:
- (b) A forest of 14,500 trees that decreases by 3.2% each year, after 7 years
Answer:
- (c) A bike worth £640 that loses 18.5% each year, after 4 years
Answer:
- 12** A bank pays interest of 2% every six months, added to the account each time. Work out the total in the account after 2 years when £10,000 is invested. (Hint: how many six-month periods are there in 2 years?)
Answer:
- 13** £1,000 is invested at 5% compound interest per year. Show that the interest earned in year 2 is £52.50. Explain why it is more than the interest in year 1.
Answer:

Exercise 5N Growth and decay: years, rates and starting amounts

Calculator allowed

- 1** Find the smallest whole number of years in each case.
- (a) £1,000 invested at 4% compound interest per year: first year it is worth more than £1,500
Answer:
- (b) £5,000 invested at 3% compound interest per year: first year it is worth more than £6,000
Answer:

(c) A £20,000 machine loses 12% of its value each year: first year it is worth less than £10,000

Answer:

2 Work out the yearly percentage rate in each case.

(a) £3,000 grows to £5,184 in 3 years

Answer:

(b) £2,500 grows to £3,025 in 2 years

Answer:

(c) £16,000 falls to £12,960 in 2 years

Answer:

3 Work out the starting amount in each case.

(a) After 3 years at 10% growth per year the amount is £6,655

Answer:

(b) After 2 years at 5% decrease per year the value is £9,025

Answer:

(c) After 4 years at 20% growth per year the amount is £10,368

Answer:

4 The interest rates on an account are 4% in year 1, 3% in year 2 and 2.5% in year 3. Work out the total after 3 years when £5,000 is invested.

Answer:

5 A sample of a radioactive substance has a mass of 80 g. Its mass decreases by 15% every day. Work out its mass after 4 days, correct to 2 decimal places.

Answer:

6 A savings account pays 8% compound interest per year. Show that the money more than doubles in 10 years.

Answer:

7 The population of a country grows by 2% each year. Priya says, "It will double in 35 years." Use a calculator to show that she is nearly right but not quite.

Answer: