



Compound/Simple Interest

← REVISE THIS TOPIC

1 Jamal invests £500 for 3 years in an account paying 4% **simple** interest.
Work out the value of Jamal's investment at the end of 3 years. [3 marks]

$$500 \times 0.04 = 20$$
$$20 \times 3 = 60$$
$$500 + 60 = 560$$

Answer £ 560

2 Carmen invests £800 for 2 years in an account paying 3% **compound** interest.
Work out the value of Carmen's investment at the end of 2 years. [3 marks]

$$800 \times 1.03^2 = 848.72$$

Answer £ 848.72

3 Niko invests £1250 for 4 years in an account paying 6% **simple** interest.
Work out the value of Niko's investment at the end of 4 years. [3 marks]

$$1250 \times 0.06 = 75$$
$$75 \times 4 = 300$$
$$1250 + 300 = 1550$$

Answer £ 1550





- 4 Dimitri invests £7000 for 3 years in an account paying 5.5% **compound** interest.
Work out the value of Dimitri's investment at the end of 3 years. [3 marks]

$$7000 \times 1.055^3 = 8219.689625$$

Answer £ 8219.69

- 5 Layla invests £620 for 3 years in an account paying 2% **simple** interest.
Work out the value of Layla's investment at the end of 3 years. [3 marks]

$$620 \times 0.02 = 12.4$$

$$12.4 \times 3 = 37.2$$

$$620 + 37.2 = 657.2$$

Answer £ 657.20

- 6 Aiden invests £1100 for 6 years in an account paying 1.2% **compound** interest.
Work out the value of Aiden's investment at the end of 6 years. [3 marks]

$$1100 \times 1.012^6 = 1181.61436$$

Answer £ 1181.61





7 Elijah invests £4200 for 4 years in an account paying **compound** interest.

In the first year, the rate of interest is 5%

In all other years, the rate of interest is 2%

Work out the value of Elijah's investment at the end of 4 years.

[3 marks]

$$4200 \times 1.05 \times 1.02^3$$

$$= 4679.92728$$

Answer £ 4679.93

8 Esme invests £880 for 3 years in an account paying **compound** interest.

In the first year, the rate of interest is 4%

In all other years, the rate of interest is 1.5%

Work out the value of Esme's investment at the end of 3 years.

[3 marks]

$$880 \times 1.04 \times 1.015^2$$

$$= 942.86192$$

Answer £ 942.86





9 Freya wants to invest £6000 for 3 years.

Bank A

5% simple interest
per year

Bank B

4% compound
interest per year

Work out how much **more** Freya's investment would be worth at the end of the 3 years if she uses Bank A compared to Bank B. **[5 marks]**

Bank A

$$6000 \times 0.05 = 300$$

$$300 \times 3 = 900$$

$$6000 + 900 = 6900$$

Bank B

$$6000 \times 1.04^3$$

$$= 6749.184$$

$$6900 - 6749.184 = 150.816$$

Answer £

150.82





10 Luca wants to invest £780 for 4 years.

Bank A

4% compound interest per year

Bank B

Year 1:
7% compound interest

All other years:
3% compound interest

Work out which bank will give Luca the greater investment.

You must show your working.

[4 marks]

Bank A

$$780 \times 1.04^4$$
$$= 912.49$$

Bank B

$$780 \times 1.07 \times 1.03^3$$
$$= 911.99$$

Answer Bank A





11 A brand new car is worth £30000
 The value of the car decreases at a rate of 15% per year.
 Work out the value of the car when it is 3 years old. [3 marks]

$$30000 \times 0.85^3 = 18423.75$$

Answer £ 18423.75

12 The population of a city in 2025 is 340,000 2025 $\xrightarrow{+4}$ 2029
 The population is set to increase at a rate of 2% per year.
 Work out the population of the city in the year 2029. [3 marks]

$$340000 \times 1.02^4 = 368026.9344$$

Answer 368027
 (or 368026 allowed)

13 A YouTuber has 30,000 subscribers in January 2025.
 The number of subscribers increases by 7.5% per month.
 Work out how many subscribers the YouTuber will have in July 2025. [3 marks]

Jan \rightarrow July = 6 months

$$30000 \times 1.075^6 = 46299.04577$$

Answer 46299





14 In 2025, a forest covers an area of 12,000 hectares.
 Due to deforestation, the area of the forest decreases by 4% each year.
 Work out the area of the forest in 2030.
 Give your answer to the nearest hectare. 2025 → 2030
+5 [3 marks]

$$12000 \times 0.96^5 = 9784.472371$$

Answer 9784 hectares

15 A plant is measured at 45 cm tall in the spring.
 It grows by 6% each week during the summer months.
 Work out the height of the plant, to the nearest cm, after 10 weeks. [3 marks]

$$45 \times 1.06^{10} = 80.58814634$$

Answer 81 cm

16 A scientist places a sample of 80,000 bacteria in a dish.
 Each hour, the number of bacteria decreases by 18%.
 Work out how many bacteria remain in the dish after 5 hours. [3 marks]

$$80000 \times 0.82^5 = 29659.18746$$

Answer 29659 bacteria





17 Isaac invests £550 for 4 years in an account paying 3.3% **compound** interest.
 Work out how much interest Isaac made at the end of the 4 years. [3 marks]

$$550 \times 1.033^4 = 626.2734137$$

$$626.27... - 550 = 76.2734137$$

Answer £ 76.27

18 Grace invests £250 in an account paying 4% **compound** interest.
 Grace withdraws the money once it has made over £100 in interest.
 Work out how many years Grace must wait before withdrawing the money. [3 marks]

$$250 + 100 = 350 \text{ (required value)}$$

$$250 \times 1.04^9 = 341.594835$$

$$250 \times 1.04^{10} = 355.2586284$$

Answer 10

19 Mariam invests some money in an account paying 9% **compound** interest.
 Work out how many years it will take for the investment to triple in value. [3 marks]

$$1.09^{12} = 2.812664782 < 3$$

$$1.09^{13} = 3.065804612 > 3$$

Answer 13





20 Aaliyah invests some money in an account paying 4% **compound** interest.

After 2 years the investment is worth £8869.12

20 (a) Work out how much the investment was worth after 1 year. [3 marks]

$$8869.12 \div 1.04 = 8528$$

Answer £ 8528

20 (b) Work out how much the investment will be worth after 4 years. [3 marks]

$$8869.12 \times 1.04^2 \quad \leftarrow (2 \text{ more years})$$
$$= 9592.840192$$

Answer £ 9592.84

21 Rajesh invests some money for 5 years in an account paying 4.9% **compound** interest.

After 5 years the investment is worth £2769.07

Work out how much money Rajesh originally invested. [3 marks]

$$2769.07 \div 1.049^5$$
$$= 2180$$

Answer £ 2180





22

Leo invests £3200 for 2 years in an account paying **compound** interest.

After 2 years the investment is worth £3494.48

Work out the rate of interest.

[4 marks]

$$3200 \times x^2 = 3494.48$$

$$x^2 = \frac{3494.48}{3200}$$

$$x^2 = 1.092025$$

$$x = \sqrt{1.092025}$$

$$x = 1.045$$

Answer 4.5 %

23

Lucia invests £640 for 4 years in an account paying **compound** interest.

After **3 years** the investment is worth £689.21

Work out the value of Lucia's investment at the end of 4 years.

[5 marks]

$$640 \times x^3 = 689.21$$

$$x^3 = \frac{689.21}{640}$$

$$x^3 = 1.076890625$$

$$x = \sqrt[3]{1.076890625}$$

$$x = 1.025$$

$$689.21 \times 1.025 = 706.44025$$

Answer £ 706.44

