Compound/Simple Interest

SCAN ME

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.

$500 \times 0.04 = 20$

$20 \times 3 = 60$

$500 + 60 = 560$

£ 560

(Total for Question 1 is 3 marks)

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.

$800 \times 1.03^2 = 848.72$

£ 848.72

(Total for Question 2 is 3 marks)

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.

$1250 \times 0.06 = 75$

$75 \times 4 = 300$

$1250 + 300 = 1550$

£ 1550

(Total for Question 3 is 3 marks)

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.

$7000 \times 1.055^3 = 8219.689625$

£ 8219.69

(Total for Question 4 is 3 marks)

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.

$620 \times 0.02 = 12.4$
$12.4 \times 3 = 37.2$
$620 + 37.2 = 657.2$

£ 657.20

(Total for Question 5 is 3 marks)

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.

$1100 \times 1.012^6 = 1181.61436$

£ 1181.61

(Total for Question 6 is 3 marks)

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.

$4200 \times 1.05 \times 1.02^3$

$= 4679.92728$

£ 4679.93

(Total for Question 7 is 3 marks)

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.

$880 \times 1.04 \times 1.015^2$

$= 942.86192$

£ 942.86

(Total for Question 8 is 3 marks)

9 Freya wants to invest £6000 for 3 years.

Bank A	**Bank B**
5% simple interest per year	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.

Bank A

$6000 \times 0.05 = 300$

$300 \times 3 = 900$

$6000 + 900 = 6900$

Bank B

6000×1.04^3

$= 6749.184$

$6900 - 6749.184 = 150.816$

£ 150.82

(Total for Question 9 is 5 marks)

10 Luca wants to invest £780 for 4 years.

Bank A	**Bank B**
4% compound interest per year	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.

Bank A

780×1.04^4

$= 912.49$

Bank B

$780 \times 1.07 \times 1.03^3$

$= 911.99$

Bank A

(Total for Question 10 is 4 marks)

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.

$30000 \times 0.85^3 = 18423.75$

18423.75

(Total for Question 11 is 3 marks)

12 The population of a city in 2025 is 340,000
The population is set to increase at a rate of 2% per year.
Work out the population of the city in the year 2029.

2025 $\xrightarrow{+4}$ 2029

$340000 \times 1.02^4 = 368026.9344$

368027

(Total for Question 12 is 3 marks)

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.

(368026 allowed)

Jan → July = 6 months

$30000 \times 1.075^6 = 46299.04577$

46299

(Total for Question 13 is 3 marks)

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

$12000 \times 0.96^5 = 9784.472371$

9784 ..... hectares

(Total for Question 14 is 3 marks)

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.

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

81 ..... cm

(Total for Question 15 is 3 marks)

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.

$80000 \times 0.82^5 = 29659.18746$

29659 ..... bacteria

(Total for Question 16 is 3 marks)

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.

$550 \times 1.033^4 = 626.27\,34137$

$626.27\ldots - 550 = 76.2734137$

£ 76.27

(Total for Question 17 is 3 marks)

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.

$250 + 100 = 350$ (required value)

$250 \times 1.04^9 = 341.594\,835$

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

10

(Total for Question 18 is 3 marks)

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.

$1.09^{12} = 2.812\,664\,782 < 3$

$1.09^{13} = 3.065\,804\,612 > 3$

13

(Total for Question 19 is 3 marks)

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

After 2 years the investment is worth £8869.12

(a) Work out how much the investment was worth after 1 year.

$8869.12 \div 1.04 = 8528$

£ 8528

(3)

(b) Work out how much the investment will be worth after 4 years.

8869.12×1.04^2 ← (2 more years)

$= 9592.84\,0192$

£ 9592.84

(3)

(Total for Question 20 is 6 marks)

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.

$2769.07 \div 1.049^5$

$= 2180$

£ 2180

(Total for Question 21 is 3 marks)

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.

$3200 \times x^2 = 3494.48$

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

$x^2 = 1.092025$

$x = \sqrt{1.092025}$

$x = 1.045$

4.5 ..... %

(Total for Question 22 is 4 marks)

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.

$640 \times x^3 = 689.21$

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

$x^3 = 1.076890625$

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

$x = 1.025$

$689.21 \times 1.025 = 706.44025$

£ 706.44

(Total for Question 23 is 5 marks)