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. **[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

9

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

15

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. **[5 marks]**

Bank A

$6000 \times 0.05 = 300$

$300 \times 3 = 900$

$6000 + 900 = 6900$

Bank B

6000×1.04^3

$= 6749.184$

$6900 - 6749.184 = 150.816$

Answer £ 150.82

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. **[4 marks]**

Bank A

780×1.04^4

$= 912.49$

Bank B

$780 \times 1.07 \times 1.03^3$

$= 911.99$

Answer Bank A

9

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 → 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. **[3 marks]**

2025 → 2030
+5

$12000 \times 0.96^5 = 9784.472371$

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

18

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]**

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

$626.27\ldots - 550 = 76.2734137$

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]

$250 + 100 = 350$ (required value)

$250 \times 1.04^8 = 342.1422626$

$250 \times 1.04^9 = 355.8279531$

Answer 9

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]**

(2 more years)

8869.12×1.04^2

$= 9592.840192$

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

18

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