1 Harold bought an antique clock for £1200
The clock increased in value by 8% per year.

Find the value of the clock exactly 3 years after Harold bought the clock.
Give your answer correct to the nearest £.

Initial value : £1200

Year 1 : £1200 + $\frac{8}{100}$(1200) = £1296 (1)

Year 2 : £1296 + $\frac{8}{100}$(1296) = £1399.68 (1)

Year 3 : £1399.68 + $\frac{8}{100}$(1399.68) = £1511.65

≈ £1512 (nearest £) (1)

£ 1512

(Total for Question 1 is 3 marks)

2 Jan invests \$8000 in a savings account.
The account pays compound interest at a rate of x% per year.

At the end of 6 years, there is a total of \$8877.62 in the account.

Work out the value of x.
Give your answer correct to 2 decimal places.

$$8000 \times \left(\frac{100+x}{100}\right)^6 = 8877.62 \quad (1)$$

$$\left(\frac{100+x}{100}\right)^6 = \frac{8877.62}{8000}$$

$$\left(\frac{100+x}{100}\right)^6 = 1.1097025$$

$$\frac{100+x}{100} = \sqrt[6]{1.1097025} \quad (1)$$

$$\frac{100+x}{100} = 1.0175$$

$$100+x = 101.75$$

$$x = 101.75 - 100$$

$$= 1.75 \quad (1)$$

$x =$ 1.75

(Total for Question 2 is 3 marks)

3 Himari's annual salary is 3 130 000 Japanese Yen (JPY).
She gets a salary increase of 4%

(a) Work out Himari's salary after this increase.

$3\,130\,000 + \frac{4}{100} \times 3\,130\,000$ (1)

$= 3\,130\,000 + 125\,200$ (1)

$= 3255\,200$ (1)

3 255 200 JPY

(3)

Kaito bought a car.
The value of the car when Kaito bought it was 750 000 JPY.
At the end of each year, the value of his car had depreciated by 15%

(b) Work out the value of Kaito's car at the end of 3 years.
Give your answer correct to the nearest JPY.

Initial value : 750 000 JPY

End of year 1 : $\frac{85}{100} \times 750\,000$ JPY $= 637\,500$ JPY (1)

End of year 2 : $\frac{85}{100} \times 637\,500$ JPY $= 541\,875$ JPY (1)

End of year 3 : $\frac{85}{100} \times 541\,875$ JPY $= 460\,594$ JPY (1)

460 594 JPY

(3)

(Total for Question 3 is 6 marks)

4 Hamish buys a new car for $20 000
The car depreciates in value by 19% each year.

Work out the value of the car at the end of 3 years.
Give your answer to the nearest $.

Value of the car each year = 100% - 19%

= 81% (from the value at the start of each year) (1)

Value of the car at the end of year 3 = $20\,000 \times \left(\frac{81}{100}\right)^3$ (1)

= 10 629 (1)

$ 10 629

(Total for Question 4 is 3 marks)

5 Max invests $6000 in a savings account for 3 years.
The account pays compound interest at a rate of 1.5% per year for the first 2 years.

The compound interest rate changes for the third year.
At the end of 3 years, there is a total of $6311.16 in the account.

Work out the compound interest rate for the third year.
Give your answer correct to 1 decimal place.

First year : $6000 + \frac{1.5}{100} \times 6000 = 6090$

Second year : $6090 + \frac{1.5}{100} \times 6090 = 6181.35$ (1)

Third year : $6181.35 + \frac{x}{100} \times 6181.35 = 6311.16$

$\frac{x}{100} \times 6181.35 = 6311.16 - 6181.35$

$\frac{x}{100} \times 6181.35 = 129.81$ (1)

$x = \frac{129.81}{6181.35} \times 100$

$= 2.1\%$ (1)

2.1 ..... %

(Total for Question 5 is 3 marks)

Zhi bought a house on 1st January 2017
When she bought the house, its value was 120 000 yuan.

The value of the house increased by 1.8% per year.

6 (b) Work out the value of Zhi's house on 1st January 2020
Give your answer correct to 3 significant figures.

2017 to 2020 : 3 years

Value of house each year : 100% + 1.8%
: 101.8% (1)

120 000 × (101.8%)^3 (1) : 126597.34
: 127 000 (3 s.f.) (1)

127 000 ..... yuan
(3)

(Total for Question 6 is 3 marks)

7 Kuro invests 50 000 yen for 3 years in a savings account.
She gets 2.4% per year compound interest.

Work out how much money Kuro will have in her savings account at the end of the 3 years.
Give your answer correct to the nearest yen.

$100\% + 2.4\% = 102.4\%$

$= 50\,000 \times (102.4\%)^3$ ← compounded for 3 years (2)

$= 53\,687$ (1)

53 687 yen

(Total for Question 7 is 3 marks)

8 Chen invests 40 000 yuan in a fixed-term bond for 3 years.

The fixed-term bond pays compound interest at a rate of 3.5% each year.

(a) Work out the value of Chen's investment at the end of 3 years.
Give your answer to the nearest yuan.

$100\% + 3.5\% = 103.5\%$

$103.5\% \div 100 = 1.035$ (convert to decimal)

$40000 \times 1.035^3 = 44348.715$ (2)

≈ 44349 yuan (1)

44349 yuan

(3)

(Total for Question 8 is 3 marks)

9 Jane bought a new car for $18 000
The car depreciates in value by 15% each year.

Work out the value of the car at the end of 4 years.
Give your answer correct to the nearest $

Value each year : (100% − 15%) of value

= 85%

Value at the end of 4 years : $18\,000 \times \left(\frac{85}{100}\right)^4$ (2)

= 9396 (1)

$ 9396

(Total for Question 9 is 3 marks)

10 Asha bought an apartment.

The table gives information about the value of apartments, in euros, and the annual service charge band.

Value (x euros)	Service charge band
$x \geqslant 700\,000$	A
$600\,000 \leqslant x < 700\,000$	B
$500\,000 \leqslant x < 600\,000$	C
$400\,000 \leqslant x < 500\,000$	D
$0 < x < 400\,000$	E

In 2021, the value of Asha's apartment was 634 400 euros.

The value of Asha's apartment had increased by 4% from its value in 2020

(a) Has the annual service charge band changed for Asha's apartment?
Show your working clearly.

$1 + 0.04 = 1.04$ (1)

$\frac{634\,400}{1.04} \times 100\% = 610\,000$ (1)

No. Annual service charge has not changed. (1)

(3)

Pam bought a boat.

In each year after Pam bought the boat, the value of the boat depreciated by 15%

(b) Work out the total percentage by which the value of the boat had depreciated by the end of the second year after Pam bought the boat.

$100 - 15 = 85\%$

$0.85 \times 0.85 = 0.7225$ (1)

$1 - 0.7225 = 0.2775 \times 100\%$ (1)

$= 27.75\%$ (1)

27.75 ..... %

(3)

(Total for Question 10 is 6 marks)

11 Pasha invests 50 000 dollars in a savings account for 4 years.
He gets 1.3% per year compound interest.

Work out how much money Pasha will have in his savings account at the end of 4 years.
Give your answer correct to the nearest dollar.

$50\,000 \times 1.013 = 50\,650$ (1)

$50\,650 \times 1.013 = 51\,308.45$

$51\,308.45 \times 1.013 = 51\,975.45$ (1)

$51\,975.45 \times 1.013 = 52\,651$ (1)

52 651 ..... dollars

(Total for Question 11 is 3 marks)

12 Shane invests 7200 dollars for 3 years in a savings account.
He gets 2.5% per year compound interest.

How much money will Shane have in his savings account at the end of 3 years?
Give your answer to the nearest dollar.

$7200 \times (1.025)^3 = 7754$

(2) (1)

7754 ..... dollars

(Total for Question 12 is 3 marks)

13 Himari invests 200 000 yen for 3 years in a savings account paying compound interest.

The rate of interest is 1.8% for the first year and x% for each of the second year and the third year.

The value of the investment at the end of the third year is 209 754 yen.

Work out the value of x
Give your answer correct to one decimal place.

$200\,000 \times 1.018 = 203\,600$ (1)

$203\,600 + \frac{x}{100} \times 203\,600 = 209\,754$

$2036x = 209\,754 - 203\,600$

$2036x = 6154$

$x = \frac{6154}{2036}$ (1) $= 3$ for 2 years

each year: $\frac{3}{2} = 1.5$ (1)

$x =$ 1.5

(Total for Question 13 is 3 marks)

14 Teresa invests \$2000 for 3 years in a savings account.
She gets 4% each year compound interest.

(a) How much money will Teresa have in her savings account at the end of 3 years?
Give your answer correct to the nearest dollar.

$2000 \times 1.04^3 = 2250$ (2) (1)

\$ 2250

(3)

Sam invested \$$T$
The value of his investment decreased by 9% each year.

At the end of the first year, the value of Sam's investment was \$1365

(b) Work out the value of T

$T \times 0.91 = 1365$

$T = \frac{1365}{0.91}$ (2)

$= 1500$ (1)

1500

(3)

(Total for Question 14 is 6 marks)

15 Matteo is going to invest 5000 Swiss francs for two years.

He can invest his money in Bank **G** or in Bank **H**.

Bank **G**	Bank **H**
1.6% per year compound interest	2.9% interest added after two years

The total amount of interest Matteo would receive at the end of two years from Bank **G** is more than the amount of interest Matteo would receive at the end of two years from Bank **H**.

How much more?

H : $\frac{2.9}{100} \times 5000 = 145$ (1)

G : $\frac{1.6}{100} \times 5000 = 80$

$\frac{1.6}{100} \times 5080 = 81.28$ (1)

$80 + 81.28 = 161.28$

$161.28 - 145 = 16.28$ (1)

(1)

16.28

..... Swiss francs

(Total for Question 15 is 4 marks)

16 Kazi buys a car for 700 000 taka.
The value of the car depreciates by 12% each year.

Work out the value of the car at the end of 3 years.
Give your answer correct to the nearest taka.

value depreciation each year = $1 - 0.12 = 0.88$

after 3 years = $700\,000 \times 0.88^3$ (2)

$= 477\,030$ (1)

477 030 ..... taka

(Total for Question 16 is 3 marks)

17 Feruzi invests 80 000 Kenyan shillings (KES)
He invests the money for 3 years at x% compound interest each year.

At the end of 3 years, the total interest he receives is 6151.25 KES

Work out the value of x

$$80\,000 \times \left(\frac{100+x}{100}\right)^3 = 80\,000 + 6151.25 \quad (1)$$

$$\left(\frac{100+x}{100}\right)^3 = \frac{86151.25}{80000}$$

$$= 1.07689\ldots$$

$$\frac{100+x}{100} = \sqrt[3]{1.07689\ldots}$$

$$\frac{100+x}{100} = 1.025 \quad (1)$$

$$100+x = 102.5$$

$$x = 2.5 \quad (1)$$

$x =$ 2.5

(Total for Question 17 is 3 marks)

18 Charlotte buys a painting for $680
The value of the painting increases by 4% each year.

Work out the value of the painting at the end of 3 years.
Give your answer correct to the nearest $

$680 \times 1.04^3 = 764.91$ (2)

≈ 765 (1)

$ 765

(Total for Question 18 is 3 marks)