

Q1-2

1

A percentage increase of 4% is applied at the end of each year

$$7500 \times 1.04^2$$

[1]

£8112 [1]

2

A 2.5% increase is applied at the end of each year, for 3 years

$$6200 \times 1.025^3 = 6676.721875\dots$$

[2]

Round to nearest penny

£6676.72 [1]

Q3

3

First considering the Bonus Saver account

4% interest is earned in the first year, so the total at the end of the first year will be

$$£20000 \times 1.04 = £20800$$

[1]

Then in the second year, 1.5% interest is earned, so the total at the end of the second year will be

$$£20800 \times 1.015 = £21112$$

[1]

Now considering the Fixed Rate account, where 2.5% is earned each year, for 2 years

$$£20000 \times 1.025^2 = £21012.50$$

[1]

Comparing the two amounts at the end of two years

$$£21112 > £21012.50$$

So the Bonus Saver account is best over the two years [1]

Q4

4

Find the cost that Paul's car "should" be after 3 years, if it halves in value

$$£15000 \div 2 = £7500$$

[1]

Now we can calculate the actual value of the car

In the first year it depreciated by 23%, so is now 77% of its original price (100-23=77)

$$0.77 \times £15000 = £11550$$

[1]

After the first year, it depreciates by 18% each year, for the remaining two years

This means each year, it will be 82% of the value of the previous year

$$£11550 \times 0.82^2 = £7766.22$$

[1]

Compare the two values

$$£7766.22 > £7500$$

So the car has lost /less than half its value after 3 years [1]

Q5

5a

Percentage profit can be found by $\frac{\text{Amount of Profit}}{\text{Purchase Cost}} \times 100$

$$\frac{154500 - 150000}{150000} \times 100$$

[2]

3% [1]

5b

The value will increase by 4% at the end of each year, for two years

$$154500 \times 1.04^2$$

[2]

£167 107.20 [1]

Q6

6

Considering Personal Bank, where 2% compound interest is earned each year for 3 years

$$£25000 \times 1.02^3 = £26530.20$$

[1]

Considering Secure Bank, where 4.3% is earned for the first year

$$£25000 \times 1.043 = £26075$$

And then 0.9% compound interest for the remaining 2 years
Be careful with 0.9%; 9%=0.09 and 0.9%=0.009

$$£26075 \times 1.009^2 = £26546.46$$

[1]

Compare the two final amounts

$$£26546.46 > £26075$$

Secure Bank will give Anil the most interest [1]

Q7-8

7

£200 000 increases by 1.5% per year, for 4 years

$$£200\,000 \times 1.015^4 = £212\,272.71$$

Or could multiply by 0.015⁴ to find the answer directly [2]

This is the total in the account at the end of 4 years
The question asks for the total amount of **interest** earned

$$£212\,272.71 - £200\,000$$

£12 272.71 [1]

8

120 000 yuan increases by 1.8% per year, for 3 years

$$120\,000 \times 1.018^3 = 126\,597.34$$

[2]

Round to 3 significant figures

127 000 yuan [1]

Q9

9

Ali invests 25 000 dollars in Cyclone Bank, where there is 4.5% compound interest for 3 years

$$25\,000 \times 1.045^3 = 28\,529.15$$

[2]

Badia invests 25 000 dollars in Tornado Bank, where they receive 1150 dollars each year for 3 years

$$25\,000 + (3 \times 1150) = 28\,450$$

[1]

Find the difference

$$28\,529.15 - 28\,450 = 79.15$$

Round to the nearest dollar

79 dollars [1]

Q10-11

10

As the car depreciates by 19% each year, this means it falls to 81% of its value, every year ($100 - 19 = 81$), for 3 years

$$20\,000 \times 0.81^3 = 10\,628.82$$

[2]

Round to the nearest dollar

\$ 10 629 [1]

11

The house value is expected to increase by 5% *each* year, for 4 years.

$$P \left(1 + \frac{r}{100} \right)^n$$

$$\begin{aligned} 120\,000 \left(1 + \frac{5}{100} \right)^4 &= 120\,000 \times 1.05^4 \\ &= 145\,860.75 \end{aligned}$$

Method to find value after (at least) 1 year [1]

Method to find value after 4 years [1]

Answer [1]

Round your final answer to 2 significant figures.

The expected value of the house after 4 years is £150 000 (2 s. f.) [1]