

GCSE OCR Math J560

Compound Interest

Answers

"We will help you to achieve A Star"



Liam invests £6200 for 3 years in a savings account.

He gets 2.5% per annum compound interest.

How much money will Liam have in his savings account at the end of 3 years?

Total After
$$340S = 6200 \times 1025 \times 1.025$$

= 6200×1.025^3
= $\frac{2}{6676.72}$

Answer 2

Derek buys a house for £150 000 He sells the house for £154 500

(a) Work out Derek's percentage profit.



Derek invests £154 500 for 2 years at 4% per year compound interest. "KEEP MULTIPLYING"

(b) Work out the value of the investment at the end of 2 years.

PERCENTAGE INCREASES (THE BEST WAY!)

TO INCREASE BY, SAY, 3%.

THINK: WE WANT 103%. SO WE 104%.

MULTIPLY BY 103 (=1.03) MULTIPLIER=1.04

VALUE AFTER 2-1EARS = 154500 × 1.04 × 1.04

A A 1ST YEAR ZMD YEAR

= £167107.20



Anil wants to invest £25 000 for 3 years in a bank.

"KEEP MULTIPLYING"

Personal Bank

Compound Interest

2% for each year

Secure Bank

Compound Interest

4.3% for the first year 0.9% for each extra year

Which bank will give Anil the most interest at the end of 3 years? You must show all your working.

SINCE \$26546.46 > \$26530.20 THE SELVE BANK GIVES ANIL MME INTEREST

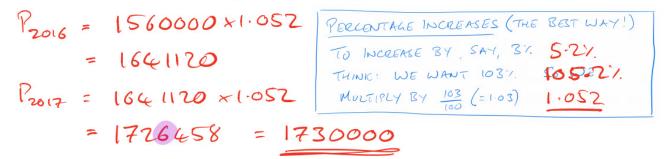


The population of a city increased by 5.2% for the year 2014

At the beginning of 2015 the population of the city was 1560000

Lin assumes that the population will continue to increase at a constant rate of 5.2% each year.

(a) Use Lin's assumption to estimate the population of the city at the beginning of 2017 Give your answer correct to 3 significant figures.



Answer 6

(b) (i) Use Lin's assumption to work out the year in which the population of the city will reach 2000000

$$P_{2018} = 1726458 \times 1.052$$

$$= 1816234$$

$$P_{2019} = 1816234 \times 1.052$$

$$= 1910678$$

$$= 1910678$$

(ii) If Lin's assumption about the rate of increase of the population is too low, how might this affect your answer to (b)(i)?

SO IT MAY REACH ZOWOOD FLARLIER



This notice was in a car magazine.

Most new cars lose more than half of their value in the first three years

Paul bought a new car.

The value of the car was £15000

In the first year, the value of the car depreciated by 23%.

After the first year, the value of the car depreciated by 18% each year.

Work out if Paul's car lost more than half of its value by the end of three years.

= 15000×0.77×0.82 ×0.82 TO DEREASE BY 237.

£7766.22

HARF ITS VALUE

PERCENTAGE DECREASES (THE BEST WAY!) VALUE AFTER BYRS TO DECREASE BY, SAY, BY.
THINK: WE WANT 97%. SO WE MULTIPLY BY 97 (=0.97)

SO MULTIPLY BY 77 (=0.77)

TO DECREASE BY 18%. SO NO IT DIDN'T

LOSE MONE THAN

LIA



Naoby invests £6000 for 5 years.

The investment gets compound interest of x% per annum.

At the end of 5 years the investment is worth £8029.35

Work out the value of x.

FINAL VALUE = INITIAL VALUE x M x M x M x M x M

$$M = \frac{8029.35}{6000}$$

$$M = 5\sqrt{\frac{8029.35}{6000}}$$

= 1,05999999 ...

$$M = 1.06 \iff 1.0x''$$

Viv wants to invest £2000 for 2 years in the same bank.

The International Bank

Compound Interest

4% for the first year 1% for each extra year

The Friendly Bank

Compound Interest

5% for the first year 0.5% for each extra year

At the end of 2 years, Viv wants to have as much money as possible.

Which bank should she invest her £2000 in?

PERCENTAGE INCREASES (THE BEST WAY!) TO INCREASE BY SAY, 3%. THINK: WE WANT 103%. SO WE MULTIPLY BY 103 (=1.03)

NTERNATIONAL

= £2100.80

 $2000 \times \frac{104}{100} \times \frac{101}{100}$ = £2100.80 = £2110.50

VIV SHOULD INVEST IN THE FRIENDLY BANK



Katie travels to work by train.

The cost of her weekly train ticket increases by 12.5% to £225

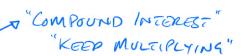
Katie's weekly pay increases by 5% to £535.50

*(b) Compare the increase in the amount of money Katie has to pay for her weekly train ticket with the increase in her weekly pay.



At the beginning of 2009, Mr Veale bought a company.

The value of the company was £50 000



Each year the value of the company increased by 2%.

(a) Calculate the value of the company at the beginning of 2017 Give your answer correct to the nearest £100

2017-2009=8 YEARS SO PERCENTAGE INCREASES (THE BEST WAY!)

MULTIPLY BY 1.02 & TIMES TO INCREASE BY, SAY, 3%. (2%)

THINK! WE WANT 103%. SO WE WORK) $V=905000\times1.02\times1.02\times...\times1.02$ MULTIPLY BY $\frac{103}{100}$ (=1.03) MULTIPLY BY 1.02

- = 50000 ×1.02
- = 58582.969 ...
- = 758600

Answer 12

Jack bought a new boat for £12500

The value, £V, of Jack's boat at the end of n years is given by the formula

$$V = 12500 \times (0.85)^n$$

(a) At the end of how many years was the value of Jack's boat first less than 50% of the value of the boat when it was new? ¥6250

V. = 12500 × 0.85 = 10625 V2 = Ans × 0.85 = 9031.25 V3 = Ans ×0.85 = 7676.56 V4 = Ans x0.85 = 6525.08 V5 = Ans x0.85 = 75546.32 SO V < SUY. AFTER 5 YRS





Ian invested an amount of money at 3% per annum compound interest. "KEEP MULTIPLYING" At the end of 2 years the value of the investment was £2652.25

MONEY AFTER = MONEY BEFORE X1.03 X1.03 TO INCREASE BY, SAY, 3%.
THINK: WE WANT 103%. SO WE THINK! WE WANT 105%. SO WE 1032 LOSS

1.032 LOSS

BEFORE = 2652.55 = 7 2500

PERCENTAGES

WRITE DOWN A

STATEMENT

CONNECTING THE

BEFORE AND AFTER

(a) Work out the amount of money Ian invested. PERCENTAGE INCREASES (THE BEST WAY!)



Katie invests £200 in a savings account for 2 years.

The account pays compound interest at an annual rate of

3.3% for the first year 1.5% for the second year

(a) Work out the total amount of money in Katie's account at the end of 2 years.

PERCENTAGE INCREASES (THE BEST WAY!)

TO INCREASE BY, SAY, 3%.

THINK: WE WANT 103%. SO WE

MULTIPLY BY 103 (=1.03)

TOTAL AFTER ZYRS = 200 x 103.3 x 101.5 = £209.70