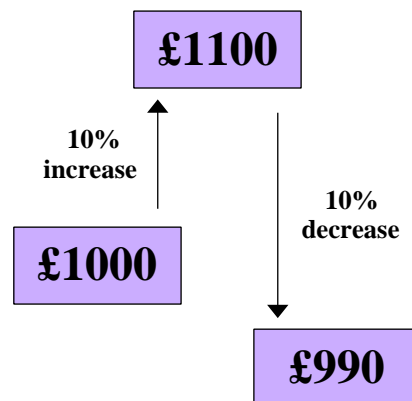*Calculator Needed !*

5.1 "Reverse" Percentage Problems

Whenever a percentage problem gives the amount *after* a percentage increase and requests the original amount, care is needed. This is because, for example, £1000 increased by 10% is £1100 but working out 10% of £1100 in an attempt to reverse the increase does not get back to the £1000.

5.2 Example

After a 2.5% salary increase, Dr Parker is paid an annual salary of £84 283
What was his salary before the increase ?

5.3 Compound Interest Example

Five years ago, Natasha bought a five-year government bond. It guaranteed to pay compound interest at a fixed rate of 4% per annum. The bond has just matured and is worth £15208.16
How much did Natasha originally pay for the bond ?

5.4 Exercise

Question 1
The current rate of VAT in the UK is 20%
I've just bought a Chinese Take-Away meal for £24.90
What is the cost of this meal before the VAT applied ?

Question 2
From an email;
"We write to you with exciting news.
  An annual subscription to our digital magazine *Crucial Mathematics* has been
  reduced by an utterly amazing 35%.
  It can now be your's for only £85.80
  Can you afford not to buy ?"
How much did Crucial Mathematics cost before the reduction ?

Question 3
GCSE Examination Question from May 2018, Q7 (b)
Jalina gets a salary increase of 5%
Her salary after the increase is HK$252 000
Work out Jalina's salary before the increase.

[3 marks]

Question 4

In 2017 the UK consumed 14.2 million metric tons of coal.

This was a reduction of 62% from 2015.

How many million metric tons of coal did the UK consume in 2015 ?

(Data Source : Digest of UK Energy Statistics (DUKES), 2018)

Question 5

In July 2019 the "Fastest Man in the World" was Usain Bolt who ran the 100 metres in a time of 9.58 seconds in the 2009 World Championships in Athletics in Berlin.

This was 1.114% faster than the previous world record.

What time was the previous world record for the 100 metres ?

HINT :

Make sure that the answer you give for the previous world record is a longer time !

Question 6

Three years ago, Robert bought a new Ford Ka+.

This model of car depreciates at 15% per annum and is now valued at £7032.

What did Robert pay for the car when it was new ?

Did you know ?

In 2006, a commercial advertising the Ford SportKa in the UK showed a pigeon flying towards it to befoul it. At the last moment, the SportKa violently pops its hood killing the bird. A second commercial showed the SportKa open its sunroof, enticing a cat to peer in. The sunroof closes, beheading the cat.

After many complaints both advertisements were removed and not used by Ford again.

Question 7

GCSE Examination Question from January 2019, Q7

Jenny invests $8500 for 3 years in a savings account.

She gets 2.3 % per year compound interest.

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

[3 marks]

Rami bought a house on 1st January 2015.

In 2015, the house increased in value by 15 %

In 2016, the house decreased in value by 8 %

On 1st January 2017, the value of the house was $687 700

(b)   What was the value of the house on 1st January 2015 ?

[3 marks]

Question 8

GCSE Examination Question from June 2019, Q5 (b)

One book that Josh owns has a value of £15 on the 1st May 2019

The value of the book had increased by 20 % in the last year.

Find the value of the book on the 1st May 2018

[3 marks]

Question 9

GCSE Examination Question from January 2017, Q10

In a sale, normal prices are reduced by 18%

The sale price of an umbrella is £25.83

Work out the normal price of the umbrella.

[3 marks]

Question 10

IMC Question from February 2019, Q3

There are 120 000 red squirrels living in Scotland.

This represents 75% of their total UK population.

How many more red squirrels live in Scotland than live in the remainder of the UK ?

Question 11

SMC Question from November 2016, Q2

On a Monday, all prices in Isla's shop are 10% more than normal.

On Friday all prices in Isla's shop are 10% less than normal.

James bought a book on Monday for £5.50.

What would be the price of another copy of this book on Friday ?