

For hints on these 3 questions Please go to the notes page.

Question 1 - There has been some improvements to the efficiency of gas engines.
Improvement 1 - saves 25% of the gas needed to run.
Improvement 2 - saves 45%
Improvement 3 - saves 30%

If you can use all 3 improvements at once what % will you save?
Obviously the engine will not run at 100% savings.
Show work, include Labels so I do not get lost.

Question 2 - You have an empty 3 Litre jug and a 5 litre jug.
You also have endless water.
I need to know how I can measure out exactly 4 litres of water.
You can dump across as many times as you want.
But you can not just measure, or mark,
no estimating or guessing,

Explain (maybe use a picture or a chart to help me understand)

Question 3 -
You create a line of coins.
You start with all pennies
Now you change every second coin to a nickel.
You then switch every third coin for a dime.
Finally you switch every fourth coin into a quarter.
If you have 20 coins how much money do you have in total?
If you have 100 coins how much now?
(Please do not walk to Vancouver)
If you have 1000 coins how much now?
(You definitely want to fly to Van)
Explain how you got your answer.

Please email me a picture or your answers by Sunday April 19

Notes/Hints (Week 1)

Question 1 Can be done in 2 steps

Discount 1 = 100% x discount as decimal = _____

Savings 1 = 100% - discount = _____

or it can be done in 1 step

Savings 1 = 100% x (100 - discount, as a decimal) = _____

Question 2 Think about the empty space in each container,
I found it easiest to organize in a chart

	3 Litre	5 Litre
Start	empty	5
Step 1 - dump across	3	2
2 -		

Question 3 Write out the pattern to get a good understanding

Step 1

5 10 15 20 25

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...

Step 2

1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1

step 3

1 5 10 5 1 10 1 5 10 5 1 10 1 5 10

step 4

1 5 10 25 1 10 1 25 10 5 1 25 1 5 10

The first 20 coins you can just add, for the 100 and 1000 you cannot.

You cannot just multiply by 5 and 50, because the pattern changes.

The first 4 add to 41, the next 4 add to 37.

For this you need to clearly understand the patterns

- after the second step every other group of 2 adds to 6.
- after step 3 every group of 3 adds to 16 but in different ways, but the exact pattern repeats after

Use the pattern to figure out 100 and 1000 then explain what you did.

If you understand the pattern you can do 101 and 1003 just as easily.

Hope this helps the 3rd one is tricky