**1** A delivery company has a total of 160 cars and vans.

the number of cars : the number of vans = 3 : 7

Each car and each van uses electricity or diesel or petrol.

$\frac{1}{8}$ of the cars use electricity.
25% of the cars use diesel.
The rest of the cars use petrol.

Work out the number of cars that use petrol.
You must show all your working.

.....

**(Total for Question 1 is 5 marks)**

**2** Cormac has some sweets in a bag.
The sweets are lime flavoured or strawberry flavoured or orange flavoured.

In the bag

$$\text{number of lime flavoured sweets} : \text{number of strawberry flavoured sweets} : \text{number of orange flavoured sweets} = 9 : 4 : x$$

Cormac is going to take at random a sweet from the bag.

The probability that he takes a lime flavoured sweet is $\frac{3}{7}$

Work out the value of $x$.

$x =$ .....

**(Total for Question 2 is 3 marks)**

**3** The points $L$, $M$ and $N$ are such that $LMN$ is a straight line.

The coordinates of $L$ are $(-3, 1)$

The coordinates of $M$ are $(4, 9)$

Given that $LM : MN = 2 : 3$,

find the coordinates of $N$.

(..... , .....)

**(Total for Question 3 is 4 marks)**

**4** Rick, Selma and Tony are playing a game with counters.

Rick has some counters.
Selma has twice as many counters as Rick.
Tony has 6 counters less than Selma.

In total they have 54 counters.

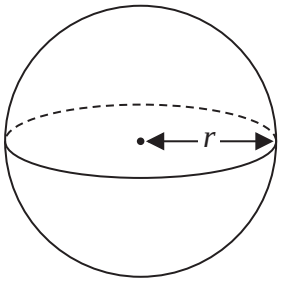
the number of counters Rick has : the number of counters Tony has = 1 : $p$

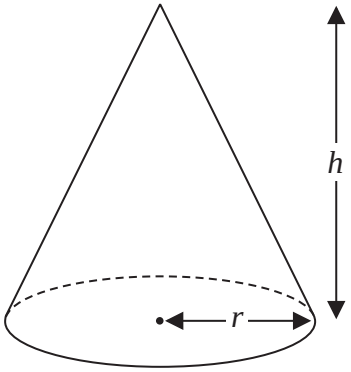
Work out the value of $p$.

$p$ = .....

**(Total for Question 4 is 5 marks)**

**5** Here is a solid sphere and a solid cone.




Volume of sphere = $\frac{4}{3}\pi r^3$

Volume of cone = $\frac{1}{3}\pi r^2 h$

All measurements are in cm.

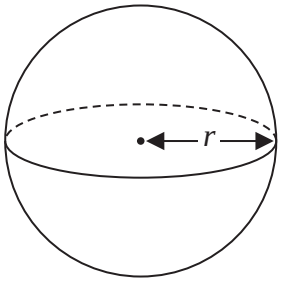
The volume of the sphere is equal to the volume of the cone.

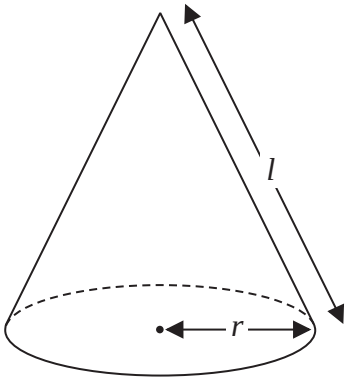
(a) Find $r : h$
Give your answer in its simplest form.

.....

**(2)**

Here is a different solid sphere and a different solid cone.




Surface area of sphere = $4\pi r^2$

Curved area of cone = $\pi r l$

All measurements are in cm.

The surface area of the sphere is equal to the **total** surface area of the cone.

(b) Find $r : h$

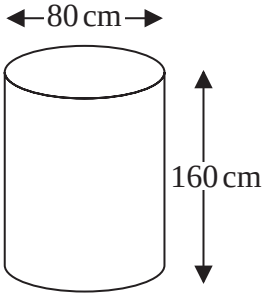
Give your answer in the form $1 : \sqrt{n}$ where $n$ is an integer.

.....

**(4)**

**(Total for Question 5 is 6 marks)**

**6** Karina has 4 tanks on her tractor.
Each tank is a cylinder with diameter 80 cm and height 160 cm.




The 4 tanks are to be filled completely with a mixture of fertiliser and water.

The fertiliser has to be mixed with water in the ratio 1 : 100 by volume.
Karina has 32 litres of fertiliser.

1 litre = 1000 $cm^3$

Has Karina enough fertiliser for the 4 tanks?
You must show how you get your answer.

**(Total for Question 6 is 4 marks)**

**7** There are four boxes on a shelf, **A**, **B**, **C** and **D**.

The total weight of **A** and **B** is 3 times the total weight of **C** and **D**.

The weight of **A** is $\frac{2}{3}$ of the weight of **B**.

The weight of **C** is 75% of the weight of **D**.

Find the ratio

weight of **A** : weight of **B** : weight of **C** : weight of **D**

.....

**(Total for Question 7 is 4 marks)**

**8** $2a : 5c = 6 : 25$
$4b : 7c = 20 : 21$

Show that $a + b : b + c = 17 : 20$

**(Total for Question 8 is 3 marks)**