

NAME: \_\_\_\_\_

Mark \_\_\_\_\_ / 25

Welcome to A-Level Chemistry at WQE. One of the biggest differences that you will notice from GCSE is the mathematical skills you will be expected to use. This exercise is designed to get you back into the habit of using some of these skills before you embark on your studies in A-Level Chemistry.

**Complete the following questions. Try your best to do as much as you can. Answer on the sheet but you can do any working in rough. This must be handed in to your teacher on the FIRST LESSON.**

1. Express the following to three significant figures:

a) 0.0072932 \_\_\_\_\_

b) 0.010025 \_\_\_\_\_

c) 3.77777 \_\_\_\_\_

d)  $4.18 \times 0.0679$  \_\_\_\_\_

2. Write the following numbers in standard form. Give your answers to three significant figures:

a) 679000 \_\_\_\_\_

b) 0.00000543 \_\_\_\_\_

c)  $(2.05 \times 10^3) \times (3.74 \times 10^{-6})$  \_\_\_\_\_

d)  $(3.96 \times 10^{-2}) / (4.86 \times 10^{-3})$  \_\_\_\_\_

3. Rearrange the following equations:

a)  $d = m / V$                        $V =$   
\_\_\_\_\_

b)  $p v = n R T$                        $T =$   
\_\_\_\_\_

c)  $M = m / c v$                        $c =$   
\_\_\_\_\_

d)  $\text{rate} = k A^2$                        $A =$   
\_\_\_\_\_

4. Convert the following units:

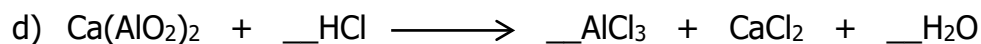
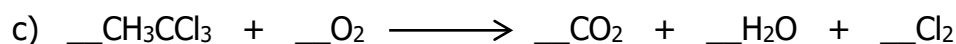
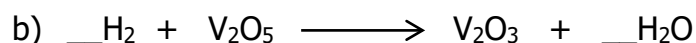
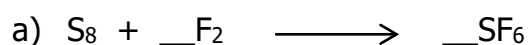
a) 10.4 kilogrammes (kg) to grammes (g) \_\_\_\_\_

b) 0.0565 grammes (g) to milligrammes (mg) \_\_\_\_\_

c) 1.06 dm<sup>3</sup> to cm<sup>3</sup> \_\_\_\_\_

d) 250 cm<sup>3</sup> to dm<sup>3</sup> \_\_\_\_\_

5. Balance the following equations:



6. A spherical glass flask of radius 6.85 cm has a mass of 45.86 g when empty. After filling with nitrogen gas, the flask weighs 46.07 g.

(The volume of a sphere is given by  $v = \frac{4}{3} \pi r^3$  and  $\pi = 3.14$ )

a) Calculate the mass of nitrogen in the flask.

b) Calculate the volume of the flask in cm<sup>3</sup>.

c) Calculate the density of the nitrogen gas in units of g/cm<sup>3</sup>.

7. Write two sentences that fully describe the particles in the nucleus of an atom.

1.

2.