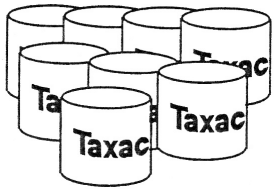
Standard Form

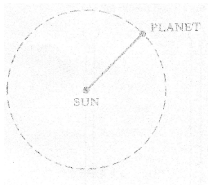
1. Each of these large oil containers holds 4.80×10^8 litres of the fuel.
How many litres are there altogether in the full tanks shown ?
Give your answer in scientific notation. 2 KU



2. A newspaper report stated
"Concorde has now flown 7.1×10^7 miles
This is equivalent to 300 journeys from the earth to the moon."
Calculate the distance from the earth to the moon.
Give your answer in **scientific notation correct to 2 significant figures.** 3 KU

3. The planet Mars is at a distance of 2.3×10^8 kilometres from the Sun.
The speed of light is 3.0×10^5 km per second.
How long does it take light from the Sun to reach Mars ?
Give your answer to the nearest minute. 3 KU

4. A planet takes 88 days to travel round the Sun.



The approximate path of the planet round the Sun is a circle with diameter 1.2×10^7 kilometres.

Find the speed of the planet as it travels round the Sun.

Give your answer in kilometres per hour, correct to 2 significant figures. 4 KU

5. The mass of a proton is approximately 1.8×10^3 times greater than the mass of an electron.
If the mass of an electron is 9.11×10^{-31} kg, calculate the mass of a proton.
Give your answer in **scientific notation correct to 2 significant figures**. 2 KU

6. Large distances in space are measured in light years.
A camera on a space telescope, photographs a galaxy, a distance of 50 million light years away. One light year is approximately 9.46×10^{12} kilometres.
Calculate the distance of the galaxy from the space telescope in kilometres.
Give your answer in scientific notation 2 KU

7. The annual profit (£) of a company was 3.2×10^9 for the year 1997.
What profit did the company make per second.
Give your answer to **three significant figures**. 2 KU

8. The total number of visitors to an exhibition was 2.925×10^7.
The exhibition was open each day from 5 June to 20 September **inclusive**.
Calculate the average number of visitors per day to the exhibition. 3 KU

9. The mass of the sun is 2.2×10^{30} kilograms.
The mass of the earth is 5.97×10^{24} kilograms.
Express the mass of the earth as a percentage of the mass of the sun.
Give your answer in **scientific notation.** 3 KU

Standard Form

1. $8 \times 4.80 \times 10^8 = 3.84 \times 10^9$

2. $7.1 \times 10^7 \div 300 = 2.4 \times 10^5$

3. Time = Distance ÷ Speed
   Time = $2.3 \times 10^8 \div 3.0 \times 10^5$
   Time = 766.67 sec = 13 minutes.

4. Distance = circumference = $2\pi r$
   Distance = $2\pi \times 0.6 \times 10^7$
   Speed = Distance ÷ Time
   Time = $88 \times 24 = 2112$ hours
   Speed = $2\pi \times 0.6 \times 10^7 \div 2112$
   Speed = 17 849. 95… = 18 000 kph (2 sf)

5. $1.8 \times 10^3 \times 9.11 \times 10^{-31} = 1.6398 \times 10^{-27}$
   $= 1.6 \times 10^{-27}$ kg (2 sf)

6. $5 \times 10^6 \times 9.46 \times 10^{12}$ km
   $= 4.73 \times 10^{19}$ km

7. 1 year (not leap year) = $365 \times 24 \times 60 \times 60$
   = 31536000 seconds
   Profit = £ $3.2 \times 10^9 \div 31536000$ = £101.47133….
   = £ 101 per second.

8. No. of days = 26 (J) + 31(J) + 31(A) + 20 (S)
   = 108

   $2.925 \times 10^7 \div 108 = 270\,833.333$
   = 270 833 visitors per day

9. $5.97 \times 10^{24} \div 2.2 \times 10^{30} \times 100$
   = 0.0002713…… %
   $= 2.71 \times 10^{-4}$ % (3 sf)