

## Week 1 Homework

1. Write 9000000 m in standard form  $9 \times 10^6$  m
2. Write 13000 Hz in standard form  $1.3 \times 10^4$  m
3. What is  $2.74 \times 10^7$  J written in expanded form 27400000 J
4. Write 0.00049 in standard form  $4.9 \times 10^{-4}$
5. Calculate  $10^{21} / 10^7$   $10^{14}$
6. Calculate  $10^{-9} / 10^3$   $10^{-12}$
7. Calculate  $10^8 / 10^{-6}$   $10^{14}$
8. Calculate  $10^{-5} / 10^{-12}$   $10^7$
9. Calculate  $(6.8 \times 10^{11}) \times (2 \times 10^4)$  (give your answer in standard form to 1 decimal place)  $1.4 \times 10^{16}$
10. Calculate  $(1.2 \times 10^{-1}) / (8.9 \times 10^{-8})$  (give your answer in standard form to 1 decimal place)  $1.3 \times 10^6$
11. How many mHz are there in 1 MHz?  $10^9$
12. How many  $\mu$ Pa are there in 1 GPa?  $10^{15}$
13. How many Tg are there in 1 ng?  $10^{-21}$
14. X-Rays have a frequency of  $3 \times 10^{17}$  Hz. If the speed of light is  $3 \times 10^8$  m/s calculate the wavelength of the X-Rays. Give your answer using a power of 10 prefix.

$$\text{wavelength} = (3 \times 10^8) / (3 \times 10^{17}) = 1 \text{ nm}$$

15. A steel wire has a diameter of 50  $\mu$ m. Calculate its cross-sectional area. Give your answer in  $\text{m}^2$  using standard form to 1 decimal place.

$$\text{Area} = \pi r^2 = \pi d^2 / 4 = \pi \times (50 \times 10^{-6})^2 / 4 = 2.0 \times 10^{-9} \text{ m}^2$$