Magnitude and Scientific (Exponential) Notation

1. Convert to scientific notation:

   100,000, precise to ±1 **1.00000×10^{5}**

   ten thousand, precise to ± 1000 **1.0×10^{4}**

   0.000400 **4.00×10^{-4}**

   0.0003 **3×10^{-4}**

   275.3 **2.753×10^{2}**

2. Convert to exponential notation:

   175,906 **1.75906×10^{5}**

   0.0000605 **6.05×10^{-5}**

   two and a half million, precise to ±100 **$2{,}500{,}000 = 2.5000 \times 10^{6}$**

   two and a half billion, precise to ± one million. **$2{,}500{,}000{,}000 = 2.500 \times 10^{9}$**

3. Express each of the following in SI base units using scientific notation:

   432 kg **4.32×10^{2} kg**

   624 ps **6.24×10^{-10} s**

   1024 ng **1.024×10^{-6} g**

   93,000 km, precise to ±10 **9.300×10^{7} m**

   1 day $1\ \text{day} \times 24 \frac{\text{h}}{\text{day}} \times 60 \frac{\text{min}}{\text{h}} \times 60 \frac{\text{s}}{\text{min}} = 86400\ \text{s} = \boxed{8.64 \times 10^{4}\ \text{s}}$

   0.0426 in. $0.0426\ \text{in} \times 2.54 \frac{\text{cm}}{\text{in}} \times \frac{1\ \text{m}}{100\ \text{cm}} = \boxed{1.08 \times 10^{-3}\ \text{m}}$