

Homework #2 - working with numbers and density

Part 1: Combining sig figs and scientific notation. For each of the following, determine the number of sig figs and write in scientific notation.

- | | |
|---|--|
| a) 4000 g <i>1 SF</i>
<i>4×10^3</i> | d) 58900 ft <i>3 SF</i>
<i>5.89×10^4</i> |
| b) 0.0019 g <i>2 SF</i>
<i>1.9×10^{-3}</i> | e) 58900.0 ft <i>6 SF</i>
<i>5.89000×10^4</i> |
| c) 50.05 g <i>4 SF</i>
<i>5.005×10^1</i> | f) 0.0120 km <i>3 SF</i>
<i>1.20×10^{-2}</i> |

Part 2: Round off each of the following to the indicated number of sig figs (indicated in parentheses) and write the number in scientific notation.

- | | |
|--|--|
| a) 2.68 g (2) <i>2.7</i>
<i>2.7×10^0</i> | d) 0.4851 in (2) <i>.49</i>
<i>4.9×10^{-1}</i> |
| b) 47.374 ml (4) <i>47.37</i>
<i>4.737×10^1</i> | e) 0.06350 ml (2) <i>.064</i>
<i>6.4×10^{-2}</i> |
| c) 24 km (1) <i>20</i>
<i>2×10^1</i> | f) 0.002300 g (3) <i>.00230</i>
<i>2.30×10^{-3}</i> |

Before beginning part 3, take a moment to read the rules for calculations using sigfigs.

Addition and Subtraction:

Your answer can't have more significant figures **after the decimal** than the smallest number of significant figures after the decimal in any of the numbers used to obtain the answer.

Examples: $12.5 \text{ cm} + 0.135 = 12.635 \text{ cm}$. *In the correct number of sigfigs: 12.6 cm*
 $0.00354 \text{ s} - 0.002 \text{ s} = 0.00154 \text{ s} = 0.002 \text{ s}$ (correct number of sigfigs)

Multiplication and Division:

Your answer can't have more **total** significant figures than the smallest total number of significant figures in any of the numbers used in the calculation.

Examples: $2.5 \text{ m} \times 1.25 \text{ m} = 3.125 \text{ m}^2 = 3.1 \text{ m}^2$ (correct number of sigfigs)
 $1000. \text{ m} / 4.35 \text{ s} = 229.8851 \text{ m/s} = 230. \text{ m/s}$ (correct number of sigfigs)

Part 3: Perform the following calculations using the appropriate number of sig figs:

- | | |
|--|--|
| <i>2 SF</i> a) 31.2×580 <i>18000</i> | f) $100 + 78$ <i>178</i> |
| <i>1 SF</i> b) 412000×0.005 <i>2000</i> | g) $74.3 - 0.21$ <i>74.1</i> |
| <i>2 SF</i> c) $82.250 / 0.0012$ <i>69000</i> | <i>1 SF</i> h) $6.02 \times 10^{23} \times 8$ <i>5×10^{24}</i> |
| <i>1 SF</i> d) $8 / 51$ <i>.2</i> | i) $8.25 \times 10^{-4} + 830$ <i>830</i> |
| e) $58 + 8.2$ <i>66</i> | <i>2 SF</i> j) $4.28 \times 10^5 / 5.0 \times 10^4$ <i>8.6</i> |