

Key

Significant Figures Worksheet

Significant Figures

1. Indicate how many significant figures there are in each of the following measured values.

246.32	<u>5</u>	1.008	<u>4</u>	700000	<u>1</u>
107.854	<u>6</u>	0.00340	<u>3</u>	350.670	<u>6</u>
100.3	<u>4</u>	14.600	<u>5</u>	1.0000	<u>5</u>
0.678	<u>3</u>	0.0001	<u>1</u>	320001	<u>6</u>

2. Calculate the answers to the appropriate number of significant figures.

$$\begin{array}{r} 32.567 \\ 135.0 \\ + 1.4567 \\ \hline 169.0237 \\ \hline \boxed{169.0} \end{array}$$

$$\begin{array}{r} 246.24 \\ 238.278 \\ + 98.31 \\ \hline 582.818 \\ \hline \boxed{582.8} \end{array}$$

$$\begin{array}{r} 658.0 \\ 23.5478 \\ + 1345.29 \\ \hline 2026.8378 \\ \hline \boxed{2026.8} \end{array}$$

3. Calculate the answers to the appropriate number of significant figures.

a) $23.7 \times 3.8 = \underline{90. \text{ or } 9.0 \times 10^1}$ f) $1.678 / 0.42 = \underline{4.0}$

b) $45.76 \times 0.25 = \underline{11}$ g) $28.367 / 3.74 = \underline{7.58}$

c) $81.04 \text{ g} \times 0.010 = \underline{0.81}$ h) $4278 / 1.006 = \underline{4252}$

d) $6.47 \times 64.5 = \underline{417}$ i) $(6.8 + 4.7) \times 17.44 = \underline{201}$
 ~~$200. \text{ or } 2.00 \times 10^2$~~

e) $43.678 \times 64.1 = \underline{2.80 \times 10^3}$ j) $(320. - 22.7) \times 3.8 = \underline{1.1 \times 10^3}$

k) $\frac{(14.86 + 13.7) \times (65.346 - 4.10)}{(43.888 - 32.888)} = \underline{1.59 \times 10^2}$
 $\frac{28.6 \times 61.25}{11.000}$

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For each of the following values, state the number of significant figures. Additionally, circle the digit that is estimated.

- | | | | |
|----------------|----------------|-------------------|-----------------|
| 1,230 <u>3</u> | 2.305 <u>4</u> | 0.010070 <u>5</u> | 0.0007 <u>1</u> |
| 7.00 <u>3</u> | 23.71 <u>4</u> | 2.0 <u>2</u> | 9.00 <u>3</u> |

Round off the following values.

- | | | | |
|-------------------|--------------------------------------|--------------------|--|
| 237 to 1 SF | <u>2×10^2</u> | 71,231 to 3 SF | <u>7.12×10^4</u> |
| 63,120 to 2 SF | <u>6.3×10^4</u> | 0.012345 to 4 SF | <u>1.235×10^{-2}</u> |
| 0.000912 to 1 SF | <u>9×10^{-4}</u> | 0.00009238 to 3 SF | <u>9.24×10^{-5}</u> |
| 1,923,100 to 3 SF | <u>1.92×10^6</u> | 14.023 to 3 SF | <u>1.40×10^1</u> |

Perform the following operations. Indicate the number of significant figures in each number, as well as the number of significant figures in your answer.

- | | | |
|---|---|--|
| $\begin{array}{r} 12.3 \\ \times 71.5 \\ \hline 879 \end{array}$ <p style="text-align: center;">3
3
3</p> | $\begin{array}{r} 0.083 \\ \times 13 \\ \hline 1.08 \end{array}$ <p style="text-align: center;">2
2
2</p> | $\begin{array}{r} 1251 \\ \times 0.0815 \\ \hline 1.25 \times 10^3 \end{array}$ <p style="text-align: center;">4
3
3</p> |
| $\frac{16}{5} = 3$ | $\frac{172}{0.0123} = 1.40 \times 10^4$ | |

Perform the following operations, following proper significant figures rules.

- | | | | | |
|--|--|---|---|---|
| $\begin{array}{r} 1700.03 \\ + 90.071 \\ \hline 1790.101 \end{array}$ <p style="text-align: center;">1790.10</p> | $\begin{array}{r} 0.083 \\ + 0.07 \\ \hline 0.153 \end{array}$ <p style="text-align: center;">0.15</p> | $\begin{array}{r} 7920.1 \\ + 357 \\ \hline 8277.1 \end{array}$ <p style="text-align: center;">8277</p> | $\begin{array}{r} 1,525,000.123 \\ - 43,250.00 \\ \hline 1,481,750.123 \end{array}$ <p style="text-align: center;">1,481,750.12</p> | $\begin{array}{r} 17.23 \\ - 5.5 \\ \hline 11.73 \end{array}$ <p style="text-align: center;">11.7</p> |
|--|--|---|---|---|

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Significant Figures

Tell how many significant figures are in each of the following measurements:

- | | |
|-------------|----------|
| 1) 421 kg | <u>3</u> |
| 2) 2,305 m | <u>4</u> |
| 3) 4,500 cm | <u>2</u> |
| 4) 0.0500 g | <u>3</u> |
| 5) 0.003 g | <u>1</u> |
| 6) 2 m | <u>1</u> |
| 7) 2.00 m | <u>3</u> |
| 8) 2300. L | <u>4</u> |

Perform the following calculations and express your answers using the correct number of significant figures.

- | | |
|---|---------------------------------|
| 9) $5.22 \text{ m} \times 82.7 \text{ m}$ | <u>432</u> m ² |
| 10) $0.0322 \text{ cm} \times 6.5 \text{ cm}$ | <u>0.21</u> cm ² |
| 11) $4.08 \text{ mL} / 0.061 \text{ mL}$ | <u>67</u> mL |
| 12) $9.475 \text{ g} / 12.05 \text{ cm}^3$ | <u>0.7863</u> g/cm ³ |
| 13) $4.375 \text{ g} + 14.62 \text{ g} + 327.9 \text{ g}$ | <u>346.9</u> g |
| 14) $2.798 \text{ mm} + 1 \text{ mm}$ | <u>4</u> mm |
| 15) $16.748 - 1.512 \text{ cm}$ | <u>15.236</u> cm |
| 16) $6.0098 \text{ mL} - 2.51 \text{ mL}$ | <u>3.50</u> mL |
| 17) $(2.1 \text{ m}) \times (3.50 \text{ m})$ | <u>7.4</u> m ² |

18) One side of a cube measures 2.76 cm. Find the volume of the cube in cubic centimeters and express your answer with the correct unit and to the correct number of significant figures.

$$V = L \times W \times h$$

$$V = (2.76)(2.76)(2.76)$$

$$V = 21.024576$$

→ 21.0 cm³