

✓ part II

00. Record the lengths and volumes on the previous page using the correct number of significant figures.

0. When you are taking quantitative data in lab, you should measure as precisely as possible/report as many significant figures as possible. Explain how you can tell how many significant figures you are allowed to report.

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|------------|-------------------------------|-------------------------------|------------|
| a. 3 cm | d. 7.0 cm | g. 35.0 cm ³ or mL | j. 36.5 mL |
| b. 3.2 cm | e. 7.00 cm | h. 22.77 mL | |
| c. 3.21 cm | f. 43.2 cm ³ or mL | i. 17.25 mL | k. 2.00 mL |

1. How many significant figures are in each of these numbers?

- | | | |
|-----------------|----------------------------------|-----------------------------------|
| 742 <u>3</u> | 0.074 <u>2</u> | 600. <u>3</u> |
| 742.1 <u>4</u> | 0.0740 <u>3</u> | 2.0020 x 10 ¹ <u>5</u> |
| 741.6 <u>4</u> | 7.4 x 10 ³ <u>2</u> | 108000 <u>3</u> |
| 740 <u>2</u> | 7.400 x 10 ³ <u>4</u> | 0.0457 <u>3</u> |
| 740. <u>3</u> | 6750 <u>3</u> | 3.000 <u>4</u> |
| 740.0 <u>4</u> | 6750. <u>4</u> | 600 <u>1</u> |
| 152.00 <u>5</u> | 0.076900 <u>5</u> | |

2. Fill in the blanks with “always”, “never”, or “sometimes.”

(If you answer “sometimes” then **explain** your answer.)

Zeroes in between two non-zeros always count as significant figures.

For example, 405 has three sig figs and 6008 has four sig. figs.

Zeroes on the left hand side of a number never count as significant figures.

For example 0.0045 has two sig. figs and .07777 has four sig. figs.

Zeroes on the right hand side of a number sometimes count as significant figures.

For example 85000 has two sig figs, 85000.0 has six sig. figs, and 0.850000 has six sig figs.

3. Rewrite each number in scientific notation so that it keeps the same number of significant figures as it started with.

- | | | |
|--|-------------------------------------|--|
| 2150 <u>2.15 x 10³</u> | 300 <u>3 x 10²</u> | 0.0070 <u>7.0 x 10⁻³</u> |
| 2150. <u>2.150 x 10³</u> | 310 <u>3.1 x 10²</u> | 0.000006780 <u>6.780 x 10⁻⁶</u> |
| 0.00025 <u>2.5 x 10⁻⁴</u> | 310.0 <u>3.100 x 10²</u> | 0.1124 <u>1.124 x 10⁻¹</u> |
| 0.0002500 <u>2.500 x 10⁻⁴</u> | 5.2 <u>5.2 x 10⁰</u> | 0.007 <u>7 x 10⁻³</u> |
| | 600.0 <u>6.000 x 10²</u> | 2146.0 <u>2.1460 x 10³</u> |

4. Round or rewrite the given number to 3 sig. figs., and to 2 sig. figs. Use scientific notation only when necessary.

Number	with 3 s.f.	with 2 s.f.
80	80.0	80.
7060	7060	7100
3.482	3.48	3.5
10.46	10.5	10.
101.46	101	1.0×10^2
20.267	20.3	20.
4	4.00	4.0
600	600.	6.0×10^2
6648.200	6650	6600
0.0002577	0.000258	0.00026
0.0030087	0.00301	0.0030
15.29	15.3	15
55014	5.50×10^4	5.5×10^4 or 55,000
719.8	720 720.	720

go back to original #

5. Perform the following operations, and then report the answer to the correct number of significant figures.

Calculator Answer: Correct sig. fig. answer:

95.13 - 86.93	8.2	8.20
12.86 + 1.627	14.487	14.49
1.457 + 10.296	11.753	11.753
3.1222 - 2.40	0.7222	0.72
15 + 1.28387	16.28387	16
15 + 1.72134	16.72134	17
23.17 - 23.06	0.11	0.11
163.43 + 1.4	164.83	164.8
126 - 3.9	122.1	122
143 + 17	160	160.

6. Perform the following operations, and then report the answer to the correct number of significant figures.

Calculator Answer: Correct sig. fig. answer:

630.2 g / 703.9 mL	0.895297	0.8953
(7.86 g/mL) * (4.55 mL)	35.763	35.8
81.97g / 10.1 mL	8.11584	8.12
10000. / 2500.	4	4.000
112.8 x 0.13	14.664	15
26 x 5.486	142.636	140
33.3 / 99.9	0.3333333333	0.333
486 / 162	3	3.00
6000. / 600.	10	10.0
31.88 / 31.9	0.999373041	1.00
31.69 / 31.7	0.999684543	1.00