There are two rules for determining the number of significant figures:

1) If there is no decimal point--start at the RIGHT and count, beginning with the first non-zero digit.

Examples

<table>
<thead>
<tr>
<th>Number</th>
<th>Significant Figures</th>
</tr>
</thead>
<tbody>
<tr>
<td>340</td>
<td>2</td>
</tr>
<tr>
<td>30400</td>
<td>3</td>
</tr>
<tr>
<td>34955</td>
<td>5</td>
</tr>
</tbody>
</table>

2) If there is a decimal point--start at the LEFT and count, beginning with the first non-zero digit.

Examples

<table>
<thead>
<tr>
<th>Number</th>
<th>Significant Figures</th>
</tr>
</thead>
<tbody>
<tr>
<td>340.</td>
<td>3</td>
</tr>
<tr>
<td>30400.</td>
<td>5</td>
</tr>
<tr>
<td>0.34955</td>
<td>5</td>
</tr>
<tr>
<td>0.00040</td>
<td>2</td>
</tr>
</tbody>
</table>

Determine the number of significant figures (s.f.) in each of the following:

a) 921          b) 92100         c) 92100.         d) 0.000210

There are also rules for reporting numbers when you multiply and/or divide:

1) Count the sig. figs. in the numbers you are multiplying and/or dividing. Your answer should be rounded off to the smallest number of sig. figs. in your problem.

Example:

<table>
<thead>
<tr>
<th>Multiply</th>
<th>Divide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number 1</td>
<td>Number 2</td>
</tr>
<tr>
<td>28.33</td>
<td>3.12</td>
</tr>
</tbody>
</table>

So round to 3 s.f.

Your answer will be reported as 88.4

b) 28.44 \( \div \) 3.12 = “9.080128205” ←------calculator answer

So round to 3 s.f.

Your answer will be reported as 9.08

Reminder: Rounding-off rules: Go to next number. If it is 0-4, round down.
If it is 5-9, round up.

Report the answer to the following problems, paying particular attention to the correct number of sig. figs.

a) 986.72 / 5.12 =

b) 497.7 / 3.0 =

c) 920.7 / 4.32 =

d) 400.20 \( \times \) 3.010 =

e) 98 \( \times \) 0.006 =

f) 0.009430 \( \times \) 4310.9 =

g) 45.20 \( \times \) 0.0071 =

h) 9.0 / 3.0 =

i) 10. \( \times \) 300. =

j) 10. \( \div \) 3 =
There are also different rules for reporting the answer when you add or subtract:

1) The answer should have the same number of decimal places as that of the number with the least decimal.

Example:

\[
\begin{align*}
4.838 \text{ g} + 1.0023 \text{ g} &= 5.8403 \text{ g} \\
486.58 \text{ g} - 421 \text{ g} &= 65.58 \text{ g}
\end{align*}
\]

\[
\begin{align*}
is 0-4, so round down. \\
is 5-9, so round up.
\end{align*}
\]

NOTE: IN ADDITION AND SUBTRACTION, DECIMAL POINTS MUST BE LINED UP!!

Solve the following:

\[
\begin{align*}
a) & \quad 0.00000313 + 17 = 0.00002013 \\
b) & \quad 4.9670 - 3.1 = 1.8670 \\
c) & \quad 0.000343 + 0.17 = 0.170343 \\
d) & \quad 78 - 0.99 = 77.01
\end{align*}
\]

e) 336,000 - 33,000.03 = 

f) 0.99 - .1 = 

Additional practice problems:

How many sig. figs in the following number?

\[
\begin{align*}
a) & \quad 87 \quad \quad \quad b) & \quad 190.\quad \quad \quad c) & \quad 0.000190 \quad \quad \quad d) & \quad 606.0 \quad \quad \quad e) & \quad 1.008 \\
\end{align*}
\]

Round off the following to 2 S.F.

\[
\begin{align*}
a) & \quad 86730 \quad \quad b) & \quad 120.99 \quad \quad c) & \quad .0003450 \quad \quad d) & \quad 0.0555 \quad \quad e) & \quad 9898989
\end{align*}
\]

How many S.F. should be in the following answers: (Don’t work out the problems!)

\[
\begin{align*}
a) & \quad 0.2 \times 43.98 = \quad \quad b) & \quad 43,000,000 \times 0.00546 = \quad \quad c) & \quad 43.0 - 17.2 = \\
d) & \quad 0.00235 - 3.0 = \quad \quad e) & \quad 143,000 - 3.45 = \quad \quad f) & \quad 3.40 \times 0.04 = \\
g) & \quad 0.300 \times 0.802 = \quad \quad h) & \quad 39.04 \times 1.009 = \quad \quad i) & \quad 0.00390 \times 2.0098 = \\
\end{align*}
\]

Solve the following problems:

\[
\begin{align*}
a) & \quad 0.004598 + 4 = 0.004598 \\
b) & \quad 43.2 \times 30.3 \times 17.0 = \quad \quad c) & \quad 338855.0 + 1000000.003
\end{align*}
\]

\[
\begin{align*}
d) & \quad 73 - 14.98 = 58.02 \\
e) & \quad 8.0 - 1.99 = 6.01 \\
f) & \quad 17.0 + 1.4 - 8.9 = \quad \quad \\
\end{align*}
\]

How many S.F. are in the following numbers?

\[
\begin{align*}
a) & \quad 3.0 \times 10^9 \quad \quad b) & \quad 0.0090 \quad \quad c) & \quad 4.20 \times 10^4 \quad \quad \\
d) & \quad 900,000 \quad \quad e) & \quad 900,000 \quad \quad f) & \quad 9.4450 \times 10^7
\end{align*}
\]