Unit 7: Decimals

Friendly Notes

Tenths, Hundredths, and Thousandths

1 one = 10 tenths
1 tenth = 10 hundredths
1 hundredth = 10 thousandths

1. Write 42 tenths as a decimal.

42 tenths = 40 tenths + 2 tenths
= 4 ones + 2 tenths
= 4 + 0.2
= 4.2

2. Find the value of the digit 6 in 2.563.

2.563 = 2 ones 5 tenths 6 hundredths 3 thousandths
= 2 + 0.5 + 0.06 + 0.003

The digit 6 is in the hundredths place.
The value of the digit 6 is 0.06.

2.563 has 3 decimal places. The tenths place, hundredths place, and thousandths place are called decimal places.
3. What number is 0.001 more than 5.083?

\[5.083 = 5 \text{ ones} + 8 \text{ hundredths} + 3 \text{ thousandths}\]

\[0.001 = 1 \text{ thousandth}\]

\[3 \text{ thousandths} + 1 \text{ thousandth} = 4 \text{ thousandths}\]

5.084 is 0.001 more than 5.083.

4. Which is smaller, 8.246 or 8.232?

<table>
<thead>
<tr>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
<th>Thousandths</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

3 hundredths is smaller than 4 hundredths. So, 8.232 is smaller.

5. Which is greater, 51.378 or 51.379?

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
<th>Thousandths</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
<td>3</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>3</td>
<td>7</td>
<td>9</td>
</tr>
</tbody>
</table>

9 thousandths is greater than 8 thousandths. So, 51.379 is greater.
Approximation

To round a decimal to the nearest whole number, we look at the digit in the first decimal place. If it is 5 or greater, we round up. If it is less than 5, we round down.

1. Round 4.2 m to the nearest meter.

   4.2
   4.2 m ≈ 4 m

   The digit 2 in the first decimal place is less than 5. So, we round down.

To round a decimal to 1 decimal place, we look at the digit in the second decimal place. If it is 5 or greater, we round up. If it is less than 5, we round down.

2. Round 6.28 to 1 decimal place.

   6.28
   6.28 ≈ 6.3

   The digit 8 in the second decimal place is greater than 5. So, we round up.
3. Round 10.845 to 1 decimal place.

\[
\begin{align*}
10.845 & \\
10.845 & \approx 10.8
\end{align*}
\]

To round a decimal to 2 decimal places, we look at the digit in the third decimal place. If it is 5 or greater, we round up. If it is less than 5, we round down.

4. Round 15.649 to 2 decimal places.

\[
\begin{align*}
15.649 & \\
15.649 & \approx 15.65
\end{align*}
\]

5. Round 103.821 to 2 decimal places.

\[
\begin{align*}
103.821 & \\
103.821 & \approx 103.82
\end{align*}
\]
Add and Subtract Decimals

1. Add 5.84 and 6.78.

\[
\begin{array}{c}
5.84 \\
+ 6.78 \\
\hline
12.62
\end{array}
\]

Add the
hundredths.

Add the
tenths.

Add the
ones.

2. Subtract 4.29 from 7.03.

\[
\begin{array}{c}
7.03 \\
- 4.29 \\
\hline
2.74
\end{array}
\]

Subtract the
hundredths.

Subtract the
tenths.

Subtract the
ones.

3. Estimate. Then find the value of 2.2 + 4.95.

\[
2.2 + 4.95 \approx 2 + 5 \\
= 7
\]

2.2 + 4.95 = 7.15

4. Estimate. Then find the value of 8.05 – 3.47.

\[
8.05 - 3.47 \approx 8.10 - 3.50 \\
= 4.60
\]

8.05 – 3.47 = 4.58
Multiply and Divide Decimals by a 1-Digit Whole Number


\[
\begin{array}{c}
8.62 \\
\times 4 \\
\hline
8 \\
48 \\
34.8
\end{array}
\]

- Multiply the hundredths by 4.
- Multiply the tenths by 4.
- Multiply the ones by 4.

2. Divide 3.15 by 5.

\[
\begin{array}{c}
5 \mid 3.15 \\
3 \\
1
\end{array}
\]

- Divide 31 tenths by 5.
- Divide 15 hundredths by 5.

3. Estimate. Then find the value of 3.12 \times 4.

\[
3.12 \times 4 \approx 3 \times 4 \\
= 12 \\
3.12 \times 4 = 12.48
\]

4. Estimate. Then find the value of 14.6 ÷ 8.

\[
14.6 \div 8 \approx 16 \div 8 \\
= 2 \\
14.6 \div 8 = 1.825
\]
Multiplication by Tens, Hundreds, or Thousands

The value of a decimal is increased 10 times when multiplied by 10.

1. Multiply 0.425 by 10.
   
   \[0.425 \times 10 = 4.25\]
   \[0.425 \times 10^1 = 4.25\]

2. Multiply 0.425 by 20.
   
   \[0.425 \times 20 = 0.425 \times 2 \times 10\]
   \[= 0.85 \times 10\]
   \[= 8.5\]

The value of a decimal is increased 100 times when multiplied by 100.

3. Multiply 3.806 by 100.
   
   \[3.806 \times 100 = 380.6\]
   \[3.806 \times 10^2 = 380.6\]

When a decimal is multiplied by 100, we move the decimal point 2 places to the right.

   
   \[3.806 \times 500 = 3.806 \times 5 \times 100\]
   \[= 19.03 \times 100\]
   \[= 1,903\]
The value of a decimal is increased 1,000 times when multiplied by 1,000.

5. Multiply 4.782 by 1,000.
   \[4.782 \times 1,000 = 4,782\]
   \[4.782 \times 10^3 = 4,782\]

When a decimal is multiplied by 1,000, we move the decimal point 3 places to the right.

6. Multiply 0.365 by 6,000.
   \[0.365 \times 6,000 = 0.365 \times 6 \times 1,000\]
   \[= 2.19 \times 1,000\]
   \[= 2,190\]

Division by Tens, Hundreds, or Thousands

The value of a decimal is reduced 10 times when divided by 10.

1. Divide 0.89 by 10.
   \[0.89 \div 10 = \frac{0.89}{10}\]
   \[= 0.089\]

When a decimal is divided by 10, we move the decimal point 1 place to the left.
2. Divide 52.5 by 30.

\[ 52.5 \div 30 = 52.5 \div 3 \div 10 \]
\[ = 17.5 \div 10 \]
\[ = 1.75 \]

The value of a decimal is reduced 100 times when divided by 100.

3. Divide 18.8 by 100.

\[ 18.8 \div 100 = \frac{18.8}{100} \]
\[ = 0.188 \]

\[ 18.8 \div 10^2 = \frac{18.8}{10^2} \]
\[ = 0.188 \]

When a decimal is divided by 100, we move the decimal point 2 places to the left.

4. Divide 27.9 by 900.

\[ 27.9 \div 900 = 27.9 \div 9 \div 100 \]
\[ = 3.1 \div 100 \]
\[ = 0.031 \]
The value of a decimal is reduced 1,000 times when divided by 1,000.

5. Divide 62.7 by 1,000.

\[
62.7 \div 1,000 = \frac{62.7}{1,000} = 0.0627
\]

\[
62.7 \div 10^3 = \frac{62.7}{10^3} = 0.0627
\]

6. Divide 49 by 7,000.

\[
49 \div 7,000 = 49 \div 7 \div 1,000 = 7 \div 1,000 = 0.007
\]

When a decimal is divided by 1,000, we move the decimal point 3 places to the left.