

Math 7 – Review Unit Tutorial

1. Decimals:

Question 1: What are decimals?

Answer: decimals are numbers that are expressed using a decimal point
Examples: 3.14; 235.6; 10,100.14, etc.

A. Place Value:

You can understand decimals by using the place value pattern. Place values tell you the value of each digit in a number. In our decimal system, each place has ten times the value of the place to its right

THOUSANDS PERIOD			ONES PERIOD				DECIMALS				
hundreds	tens	ones	hundreds	tens	ones	AND	tenths	hundredths	thousandths	ten thousandths	hundred thousandths
	7	1,	9	0	5	•	4	6	5	2	1

B. Reading Decimals:

tens	ones	AND	tenths	hundredths	thousandths
2	5	•	4	6	5

The decimal part is read like a whole number and then always given the name of the last place it holds, so the number above is read as:

Twenty - five and forty hundred sixty-five thousandths.

The digit 6 is in the hundredths place.

The value of the 6 is six thousandths, $\frac{6}{100}$.

C. Ways of Writing Whole Numbers:

Standard Form	83.904
Word Form	Eighty-three and nine hundred four thousandths
Short Word Form	83 and, 904 thousandths
Expanded Form	$(8 \times 10) + (3 \times 1) + (9 \times \frac{1}{10}) + (0 \times \frac{1}{100}) + (4 \times \frac{1}{1,000})$
Exponential Form	$(8 \times 10^1) + (3 \times 10^0) + (9 \times 10^{-1}) + (0 \times 10^{-2}) + (4 \times 10^{-3})$

D. Comparing Decimals:

When you compare any numbers you use one of three symbols:

- > - “is greater than”
- < - “is less than”
- = - “is equal to”

The wider side of the symbol is next to the greater number.

Just a Reminder



You can use what you know about place values to compare decimals:

Example: Compare 23.4375 and 23.375

<i>Line up the decimal points</i>	<i>Begin at the <u>left</u>, find the first place where the digits are different</i>	<i>Compare the values of those digits</i>
$\begin{array}{r} 23.4375 \\ 23.375 \end{array}$	$\begin{array}{r} 23.4375 \\ 23.375 \\ \uparrow \text{different} \end{array}$	$0.4 > 0.3$ So, $23.4375 > 23.375$

You can use what you know about place values to compare decimals:



Example: Compare 53.082 and 53.08

<i>Line up the decimal points</i>	<i>Begin at the <u>left</u>, find the first place where the digits are different</i>	<i>Compare the values of those digits</i>
$\begin{array}{r} 53.082 \\ 53.080 \\ \uparrow \text{Add a 0} \end{array}$	$\begin{array}{r} 53.082 \\ 53.080 \\ \uparrow \text{different} \end{array}$	$0.2 > 0.0$ So, $53.082 > 53.08$

E. Ordering Decimals:

You can also use what you know about place values to order whole numbers:

Example: Arrange 0.32, 0.212, 0.3 from least to greatest.

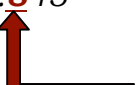



Fill in missing digits with 0s then Line up the decimals points	Begin at the left. Find the first place where the digits are different	Compare the remaining decimals
0.320 0.212 0.300  Lining up the decimal points will make the place values line up	0.320 0.212 0.300  $0.3 > 0.2$, so $0.322 > 0.212$ and $0.300 > 0.212$ <u>0.212 is the least</u>	0.320 0.300 $0.02 > 0.00$, so, $0.322 > 0.300$

Therefore, from least to greatest: 0.212; 0.3; 0.32

F. Rounding Decimals:

When you round numbers, it gives us a "rough idea" of an amount. Sometime this is for convenience; sometimes it is out of necessity, for instance when dealing with decimals.

Example: Round 75.845 to the nearest tenths place, then nearest hundredths place.

Find the place value <u>that you are rounding to:</u>	Look at the digit one place to the right:	Round	
$75.\underline{8}45$  underline the 8	$75.\underline{8}45$  look to the right	If the digit to the right is 5 or greater, round the 8 up. If the digit to the right is 4 or less, don't change the 8 .	So the answer is: 75.8
$75.8\underline{4}5$  underline the 4	$75.8\underline{4}5$  look to the right	If the digit to the right is 5 or greater, round the 4 up. If the digit to the right is 4 or less, don't change the 4 .	So the answer is: 75.85

F. Addition and Subtraction:

To Add or Subtract decimals – line up the decimal points in a column, balance up the columns with 0s and apply the appropriate rules for addition or subtraction:

Example 1:

Add: $254.8 + 12.35 + 91$

$$\begin{array}{r}
 \overset{1}{2} \overset{1}{5} 4 . 8 0 \\
 + \quad 1 2 . 3 5 \\
 + \quad 9 1 . 0 0 \\
 \hline
 3 5 8 . 1 5
 \end{array}$$

Be sure to carry when the sum is greater than 10!

Balance up the columns with 0s!

Be sure to line up the decimal points!

Example 2:

Subtract: $25.72 - 18.2$

$$\begin{array}{r}
 \overset{1}{2} \overset{15}{5} . 7 2 \\
 - \quad 1 8 . 2 0 \\
 \hline
 7 . 5 2
 \end{array}$$

Be sure to borrow and rename when the subtrahend is too large!

Be sure to line up the decimal points!

Example 3:

Find the sum: 32.5 and 11.75

$$\begin{array}{r}
 \overset{1}{3} 2 . 5 0 \\
 + \quad 1 1 . 7 5 \\
 \hline
 4 4 . 2 5
 \end{array}$$

Find the sum means to add the numbers together!

Example 4:

Subtract 32.14 from 75.6

$$\begin{array}{r}
 \overset{5}{7} \overset{1}{5} . \overset{1}{6} 0 \\
 - \quad 3 2 . 1 4 \\
 \hline
 4 3 . 4 6
 \end{array}$$

The number that you are subtracting something from is the minuend and goes first when you place it in a column!

Example 5:

What is the total of 19.9 , 9.71 and 4.3 ?

$$\begin{array}{r}
 \overset{2}{1} \overset{1}{9} . 9 0 \\
 + \quad 9 . 7 1 \\
 + \quad 4 . 3 0 \\
 \hline
 3 3 . 9 1
 \end{array}$$

When you find the total amount of something you add the numbers together!

Example 6:

From 24.71 , subtract 14.91

$$\begin{array}{r}
 \overset{1}{2} \overset{13}{4} . \overset{1}{7} 1 \\
 - \quad 1 4 . 9 1 \\
 \hline
 9 . 8 0
 \end{array}$$

The number that you are subtracting is called the subtrahend and goes second when you put it in a column!

Example 7:

How many is 19.9 , 9.71 and 43 ?

$$\begin{array}{r}
 \overset{2}{1} \overset{1}{9} . 9 0 \\
 + \quad 9 . 7 1 \\
 + \quad 4 3 \\
 \hline
 7 2 . 6 1
 \end{array}$$

When you find the total amount of something you add the numbers together!

Example 8:

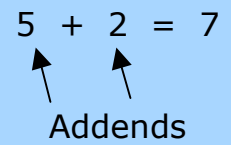
Find the difference: 25.11 and 18.59

$$\begin{array}{r}
 \overset{1}{2} \overset{14}{5} . \overset{10}{1} 1 \\
 - \quad 1 8 . 5 9 \\
 \hline
 6 . 5 2
 \end{array}$$

When you find the difference between two numbers you subtract the smaller number from the larger number!

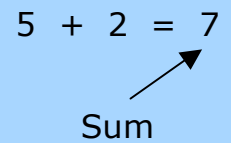
Some vocabulary you need for addition and subtraction:

1. addend – the numbers that we add together are called the addends.



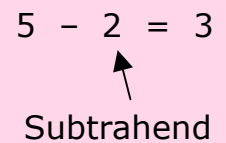
$5 + 2 = 7$
↑ ↑
Addends

2. sum – the answer you get when you add numbers together is called the sum.



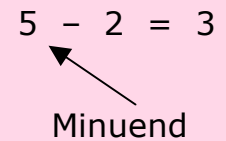
$5 + 2 = 7$
 ↗
Sum

3. subtrahend – the number we are subtracting from another number is called the subtrahend.



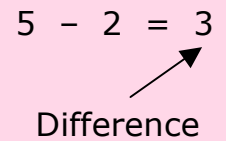
$5 - 2 = 3$
 ↑
Subtrahend

4. minuend – the number that we are subtracting something from is called the minuend.



$5 - 2 = 3$
↑
Minuend

5. difference – the answer you get when you subtract one number from another is called the difference.



$5 - 2 = 3$
 ↗
Difference

G. Multiplication & Division:

To Multiply or Divide whole numbers –

Example 1:

Multiply: 32.81×1.25

$$\begin{array}{r}
 32.81 \\
 \times 1.25 \\
 \hline
 16405 \\
 65620 \\
 328100 \\
 \hline
 41.0125
 \end{array}$$

Be sure to indent these rows to reflect that you are multiplying by 10 and 100

Example 2:

Divide: $34.31 \div 2.35$

$$\begin{array}{r}
 146 \\
 2.35 \overline{)34.310} \\
 \underline{235} \\
 1081 \\
 \underline{940} \\
 1410 \\
 \underline{1410} \\
 0
 \end{array}$$

Be sure to bring one number down at a time from the dividend!

Example 3:

Find the product of 23.1 and 17.8

$$\begin{array}{r}
 23.1 \\
 \times 17.8 \\
 \hline
 1848 \\
 16170 \\
 23100 \\
 \hline
 411.18
 \end{array}$$

Product refers to multiplication, so finding the product means to multiply!

Example 4:

Find the Quotient of 34,310 and 235

$$\begin{array}{r}
 146 \\
 235 \overline{)34,310} \\
 \underline{235} \\
 1081 \\
 \underline{940} \\
 1410 \\
 \underline{1410} \\
 0
 \end{array}$$

Quotient refers to division, so finding the quotient means to divide!

Example 5:

Express the product of 15.7 and 3.5

$$\begin{array}{r}
 15.7 \\
 \times 3.5 \\
 \hline
 785 \\
 4710 \\
 \hline
 54.95
 \end{array}$$

Product refers to multiplication, so finding the product means to multiply!

Example 6:

Divide: 34,310 by 235

$$\begin{array}{r}
 146 \\
 235 \overline{)34,310} \\
 \underline{235} \\
 1081 \\
 \underline{940} \\
 1410 \\
 \underline{1410} \\
 0
 \end{array}$$

Be sure to bring one number down at a time from the dividend!

Example 5:

Multiply: 6.93 by 0.84

$$\begin{array}{r}
 6.93 \\
 \times 0.84 \\
 \hline
 2572 \\
 55440 \\
 \hline
 5.8012
 \end{array}$$

Be sure to indent these rows to reflect that you are multiplying by 10 and 100

Example 6:

Divide: $34,310 \div 235$

$$\begin{array}{r}
 146 \\
 235 \overline{)34,310} \\
 \underline{235} \\
 1081 \\
 \underline{940} \\
 1410 \\
 \underline{1410} \\
 0
 \end{array}$$

Be sure to bring one number down at a time from the dividend!

Some vocabulary you need for multiplication and division:

1. factor – A number that is multiplied by another number to get a product is called a factor.

$$5 \times 2 = 10$$

Factors

2. product – the answer you get when you multiply numbers together is called the product.

$$5 \times 2 = 10$$

Product

3. dividend – The number that is being divided in a division problem is called the dividend.

$$10 \div 2 = 5$$

Dividend

4. divisor – The number by which a dividend is divided in a division problem is called the divisor.

$$10 \div 2 = 5$$

Divisor

5. quotient – the answer you get when you divide one number into another is called the quotient.

$$10 \div 2 = 5$$

Quotient