TUTORIAL SETS 47, 48, 49, 50 AND 51 COMBINED

Decimal Numbers, Additional Instructions with Fractions and Percentages

Tutorial Set 47- Decimal Numbers with Fractions

The two most important number systems are the decimal system and the binary number system. The number of characters or digits in the system determines the base of the system. All number systems will have zero as the first digit. The binary system is used by computers. The base is 2 and the digits are 0 and 1. We will be concerned with the decimal number system which has 10 digits being 0,1,2,3,4,5,6,7,8 and 9. The decimal system is a positional number system with the weight of the number depending on its position. A decimal number can have a whole part and a fractional part. When a number is written with a decimal point, the digits to the left of the decimal point represent the whole part while the part to the right of the decimal point is the fractional part. The first number to the left of the decimal point represents the number of 1s; The next number represents the number of 10s (10 being 10 times one); The next number represents the number of 100s (10 times 10); This is followed by 10 times 100 which gives 1000s, 10 times 1000 which gives 10,000, etc. Considering the fractional part, the first digit to the right of the decimal point is the number of tenths. (A 6 would mean 6/10); The next number to the right gives the number of hundredths. (A 3 would mean 3/100); This is followed by 1/1000, etc.

As an example, the number 6834.582 (considering the whole part first then the fraction) is:
Four 1s, three 10s, eight 100s, six 10,000s, five 1/10s, eight 1/100s and two 1/1000s.
(You might view examples on YouTube if you need additional information. An example of adding two decimal numbers is as follows:

$$\begin{array}{r} 454.864 \\ +363.472 \\ \hline 818.336 \end{array}$$

View videos on YouTube concerning "Dividing numbers and decimal fractions". You will find examples such as 3/4 = .75 and 35/8 = 4.375.

For your assignment, divide these numbers. Take the decimal part to the 3rd place.

1. 50/8
2. 160/7
3. 2740/25

Tutorial Set 48- Additional Instructions with Fractions- Adding Improper Fractions

A proper fraction is one in which the numerator is less than the denominator such as 2/5. An improper fraction, on the other hand, is one in which the numerator is greater than the denominator such as 7/5.

A mixed fraction is a number that is a mixture of, or contains, a whole number and a fractional part. Improper fractions can be written as a mixed fraction. For an example of an improper faction above, we used 7/5. In that 5/5 =1, we can write 7/5 as 1 + 2/5 or $1\ ^{2}/_{5}$

There are two ways for adding mix numbers which will be demonstrated.

Method 1: Add the whole parts of the numbers and add the fractional part of the numbers separately, combine the two parts and simplify.

Example: 3 1/2 + 4 2/3
Add the whole numbers as 3 + 4 = 7.
Add the fractions as 1/2 + 2/3 = 3/6 + 4/6 = 7/6 = 1 1/6
We see that we can now add the two results to give 8 1/6.

Method 2: Change each of the mixed numbers to improper fractions (the numerator will be greater than the denominator), find a common denominator, add the two fractions and then convert to a mixed fraction.

Example: 3 1/2 + 4 2/3 = 7/2 + 14/3 = 21/6 + 28/6 = 49/6 = 8 1/6.

For your exercise, add the following using both methods:

1. 2 1/6 + 4 2/3
2. 5 ¼ + 2 2/3
3. 6 ¾ + 5 4/6
4. 3 4/5 + 8 ¾

Tutorial Set 49- Examples with Percentages

One percent of a number is equal to the number divided by 100. The equivalence is to multiple the number by 1/100 = .01. When we multiple a number by .01, we simple move the decimal point two places to the left. If we wanted x percent of a number, multiply by x and then divide by 100 or multiply by .01x. As an example, 50% of 200 is .01(50) x (200) = .50x200 = 100. Note that 50% of a number is half the number. As another example, 8.5% of 400 is 8.5x(.01)x400 = .085x400 =34. Note that we could have first calculated 1% of 400 as 4 and then multiplied by 8.5 to get 34. (A simplified method will be discussed later.)

For your exercise, work the following:

1. Find 20% of 500
2. Find 8% of 125
3. Find 7.5% of 245.50

Tutorial Set 50- Examples with Money or Currency

Our currency system is based on the decimal system. You should be familiar with the following:
5 pennies = a nickel; 10 pennies = a dime; 25 pennies = a quarter; 100 pennies = a dollar;
2 nickels = a dime; 5 nickels = a quarter; 10 dimes = a dollar; 4 quarters = a dollar.

Use should understand how to multiply fractions (especially by whole numbers).

Example 1: Find the cost of 8 bags of plant soil if it cost $6.45 per bags

$$\begin{array}{r} \$6.45 \\ \times 8 \\ \hline \$51.60 \end{array}$$

Example 2: A computer is listed with a price of $485 with 8% sales tax. What is the total cost of the computer? Find the tax to be paid as follows:

$$\begin{array}{r} \$485 \\ \times .08 \\ \hline \$38.80 \end{array}$$

The total cost is $485 + $38.80 = $523.80

Work the following problems:

1. A list price for a new car is $24,560. The sale tax is 8%. What is the total cost?
2. A list price for a new house is $180,000. The sale tax is 8%. What is the total cost?
3. A list price for a lawn mower is $250.25. The sale tax is 7.5%. What is the total cost?

Tutorial Set 51- Additional Examples with Percentages

To change a number from percentage to a decimal fraction, divide by 100 or move the decimal point (assume to be at the right of the number) two places to the left, so 45% = .45.

To change a number from a decimal fraction to a percent, multiply by 100 or move the decimal point two places to the right, so .52 = 52%. If the number is greater than 1, then the percentage will be greater than 100% so 3.4 = 340%. (If every person with a virus gave it to 4 more people, there would be a 400% increase of persons with the virus.)

The percentage change =100(ending value – beginning value)/ (beginning value). As an example, if the temperature at 8 AM was 60 degrees and at 2 PM it was 84 degrees, the percentage change would be 100(84 – 60)/60 = 240/60 = 40%.

To find a given percentage of a number, change it from percent to a decimal fraction and multiply it by the number, so 40% of 500 is .40(500) = 200.

Work the following problems:

1. The total cost of a car, including the list price and 8% tax, was $26,000. What was the list price of the car?
2. The level of the Mississippi river went from 34 feet down to 28 feet. What was the percentage change?
3. The phone company decided to show the list price and taxes all together (taxes not given separately). If the company is selling the phone for $60 and the 8% sales tax is included in this price, what was the actual list price?
4. What is 12.5% of 200?