COMPARING FRACTIONS, MIXED NUMBERS AND DECIMALS

To compare two fractions rewrite the fractions with their least common denominator and then make equivalent fractions.

Example 1: Which is greater: $\frac{1}{2}$ or $\frac{1}{4}$?

Because $\frac{1}{4}$ is already expressed in fourths, we have to make $\frac{1}{2}$ into an equivalent fraction. Multiplying the numerator by 2 will give us $\frac{1\cdot2}{2\cdot2}=\frac{2}{4}$. Comparing the two fractions, we can see that $\frac{1}{2}$ is greater than $\frac{1}{4}$.

Example 2: Which is less: $13\frac{2}{9} or\ 13\frac{7}{15}$?
Since the whole numbers are the same we just have to compare the fractions. The least common denominator is 45. So we have:

$$\frac{2\cdot5}{9\cdot5}=\frac{10}{45} \qquad \frac{7\cdot3}{15\cdot3}=\frac{21}{45}$$

Since the first numerator, 10 , is less than the second, 21, the first fraction is less.

Example 3: Place the following fractions in increasing order (smallest to largest): $\frac{2}{3},\frac{1}{3},\frac{5}{6},\frac{3}{4}$

The LCD is 12.

$\frac{8}{12},\frac{4}{12},\frac{10}{12},\frac{9}{12}$ Rewrite each fraction using the LCD

$\frac{4}{12},\frac{8}{12},\frac{9}{12},\frac{10}{12}$ Arrange the fractions in ascending order

$\frac{1}{3},\frac{2}{3},\frac{3}{4},\frac{5}{6}$ Reduce the fractions back to their original form

To compare decimals you must compare the corresponding decimal places.

Example 4: Arrange 0.0527, 0.527, 0.005, 0.1 in descending order.

It is easiest to write the decimals in a column lining up the decimal points. We first compare the tenths place; if there is more than one decimal number with the same digit in the tenths place then we must use the hundredths place to make the comparison. So, the largest decimal is 0.527 since it has a 5 in the tenths place and the rest are smaller. The second decimal is 0.1. To find the third and fourth place decimal we must go to the hundredths place and compare.
0.0527
0.527
0.005
0.1
So, in order, our decimals are 0.527, 0.1, 0.0527 and then 0.005.

Practice:

Decide which number is greater.

1. $\frac{3}{4}$ or $\frac{3}{8}$
2. $\frac{2}{11}$ or $\frac{5}{9}$
3. $\frac{9}{10}$ or $\frac{6}{7}$
4. $\frac{3}{14}$ or $\frac{4}{9}$
5. $\frac{7}{14}$ or $\frac{6}{12}$

Arrange the following numbers in decreasing order:

6. $\frac{2}{5}, \frac{1}{3}, \frac{7}{10}$ 7. $\frac{3}{10}, \frac{3}{5}, \frac{1}{4}$ 8. 0.003, 0.05, 0.053, 0.3 9. $\frac{1}{8}, \frac{1}{7}, \frac{1}{6}, \frac{1}{5}$

Arrange the following numbers in ascending order:

10. 0.02, 0.005, 0.025 11. $\frac{8}{9}, \frac{7}{12}, \frac{2}{3}$

Answers: 1. $\frac{3}{4}$ 2. $\frac{5}{9}$ 3. $\frac{9}{10}$ 4. $\frac{4}{9}$ 5. They are equal

6. $\frac{7}{10}, \frac{2}{5}, \frac{1}{3}$ 7. $\frac{3}{5}, \frac{3}{10}, \frac{1}{4}$ 8. 0.3, 0.053, 0.05, 0.003 9. $\frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \frac{1}{8}$

10. 0.005, 0.02, 0.025

11. $\frac{7}{12}, \frac{2}{3}, \frac{8}{9}$