

Comparing Fractions

The only certain way that we can compare fractions is to find a common denominator (the Least Common Denominator (LCD) is the best, but not necessary) OR to change the fraction to a decimal using division and compare the decimals. However, there are some things we should check before we find a common denominator or change the fraction to a decimal using division.

Check #1: Is one fraction more than $\frac{1}{2}$. Is one fraction less than $\frac{1}{2}$? If so, the one that is more than $\frac{1}{2}$ has to be bigger than the one that is less than $\frac{1}{2}$.

Ex. 1: Compare the fractions using $<$, $>$, or $=$.

a. $\frac{2}{9} < \frac{11}{14}$
↑ ↑
less than more than
 $\frac{1}{2}$ $\frac{1}{2}$

b. $\frac{7}{12} > \frac{2}{5}$
↑ ↑
more than less than $\frac{1}{2}$
 $\frac{1}{2}$

Check #2: Are the numerators the same? If so, we can compare the denominators. The fraction with the smaller denominator is larger.

Ex. 2: Compare the fractions using $<$, $>$, or $=$.

a. $\frac{3}{5} > \frac{3}{8}$
↑
smaller
denominator, but same
numerator

b. $\frac{5}{12} < \frac{5}{7}$
↑
smaller denominator, but same
numerator (Also, $\frac{5}{12}$ is less than $\frac{1}{2}$
and $\frac{5}{7}$ is more than $\frac{1}{2}$)

If check #1 or check #2 doesn't work, we need to find a common denominator or change the fraction to a decimal using division.

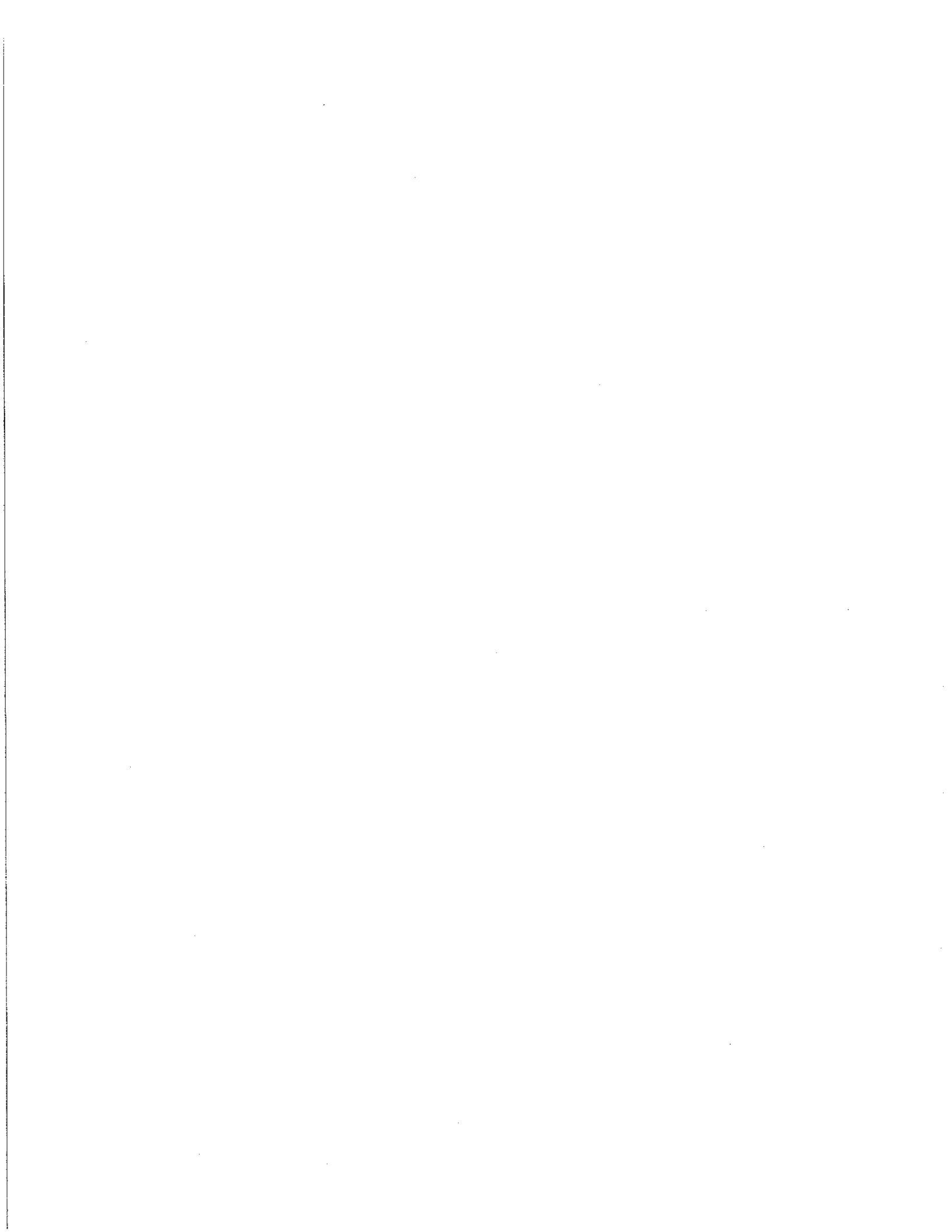
Ex. 3: Compare the fractions using $<$, $>$, or $=$.

a. $\frac{3}{4} < \frac{9}{11}$ LCD of 4 and 11 is 44.

b. $\frac{4}{5} > \frac{7}{10}$ LCD of 5 and 10 is 10.

$$\frac{3 \times 11}{4 \times 11} = \frac{33}{44} \quad \frac{9 \times 4}{11 \times 4} = \frac{36}{44}$$

$$\frac{4 \times 2}{5 \times 2} = \frac{8}{10} \quad \frac{7}{10}$$



Ordering Fractions

The only certain way to order fractions is to find a common denominator or change each fraction to a decimal using division. However, we can use the checks that we learned above to make the process easier.

Ex. 4: Order the following fractions from least to greatest.

- a. $\frac{3}{8}, \frac{5}{11}, \frac{13}{18}$ ← biggest because it is more than $\frac{1}{2}$. The other 2 are less than $\frac{1}{2}$.
- b. $\frac{7}{10}, \frac{1}{3}, \frac{5}{7}$ ← smallest because it is less than $\frac{1}{2}$. The other 2 are more than $\frac{1}{2}$.

LCD of $\frac{3}{8}$ and $\frac{5}{11}$ is 88.

$$\frac{3 \times 11}{8 \times 11} = \frac{33}{88} \quad \frac{5 \times 8}{11 \times 8} = \frac{40}{88}$$

$$\boxed{\frac{3}{8}, \frac{5}{11}, \frac{13}{18}}$$

LCD of $\frac{7}{10}$ and $\frac{5}{7}$ is 70.

$$\frac{7 \times 7}{10 \times 7} = \frac{49}{70} \quad \frac{5 \times 10}{7 \times 10} = \frac{50}{70}$$

$$\boxed{\frac{1}{3}, \frac{7}{10}, \frac{5}{7}}$$

Changing Fractions to Decimals

The only certain way to change a fraction to a decimal is to divide the numerator by the denominator. However, there are checks we can do.

Check #1: If the denominator is a multiple of 10 (10, 100, 1000, etc.) we can write the decimal.

Ex. 5: Change each fraction to a decimal.

- a. $\frac{7}{10}$ is read as "seven tenths" so the decimal is $\boxed{0.7}$.

- b. $\frac{47}{100}$ is read as "forty-seven hundredths" so the decimal is $\boxed{0.47}$.

- c. $\frac{13}{20}$

$\frac{13 \times 5}{20 \times 5} = \frac{65}{100}$ which is read as "sixty-five hundredths" so the decimal is $\boxed{0.65}$.

OR $\frac{13}{20} = 13 \div 20 =$

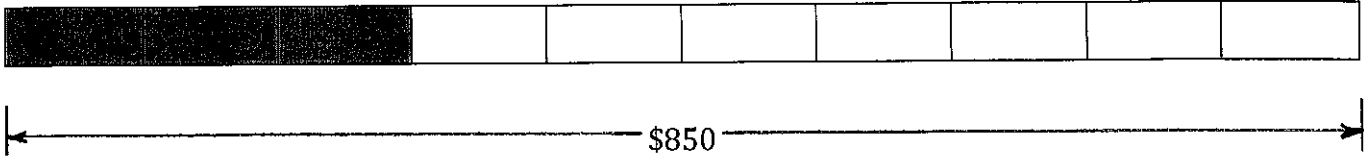
$$\begin{array}{r}
 65 \\
 20 \overline{)13.00} \\
 \underline{-120} \\
 100 \\
 \underline{-100} \\
 0
 \end{array}$$

$\boxed{0.65}$



Finding a Fraction of a Whole

Ex. 6: Ben wants to buy a flat screen TV that costs \$850. He figures that he is $\frac{3}{10}$ the way to reaching his goal. How much money has Ben saved?



The denominator in a fraction tells us how many equal parts there are. The \$850 is broken into 10 equal parts, so we can divide \$850 by 10.

$$\$850 \div 10 = \$85$$

This means that each piece is \$85. However, we need 3 pieces since the numerator is 3 and 3 pieces are shaded. If each piece is \$85, we can multiply \$85 by 10 to get how much money Ben has saved.

$$\$85 \times 3 = \boxed{\$255}$$

