

Name: \_\_\_\_\_

## Common Denominators

We've learned some 'tricks' for comparing fractions, but sometimes none of these seem to work.

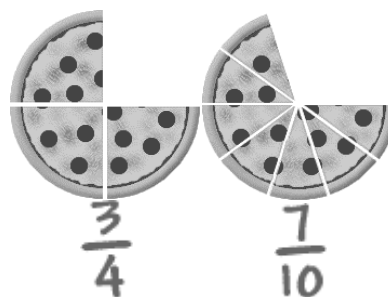
For example, which is greater  **$\frac{3}{4}$**  or  **$\frac{7}{10}$** ?

The denominators are not the same. Neither are the numerators.

Both fractions are greater than  $\frac{1}{2}$ , and neither is greater than 1.

What do we do now?

We could draw a picture. And if our picture were accurate (exact) enough, we would see that  $\frac{3}{4}$  is greater than  $\frac{7}{10}$ . But we can't always be drawing pictures of pizzas and candy bars. Is there another way? Fortunately, there is.



Here's what we do: we convert our two fractions into '*like*' fractions—fractions having a common (*the same*) denominator.

How do we do this? We look at our two denominators (4 and 10), and we pick a number that is a multiple of both of them.

Multiples of **10** are: 10, **20**, 30, etc.

Multiples of **4** are: 4, 8, 12, 16, **20**, 24, etc.

We see that **20** is the smallest multiple of both **4** and **10**.

So we are going to use **20** as our common denominator.

Now we change both of our fractions— $\frac{3}{4}$  and  $\frac{7}{10}$ —to twentieths.

We have:  $\frac{3}{4} = \frac{\quad}{20}$  and  $\frac{7}{10} = \frac{\quad}{20}$

$$\frac{3 \times 5}{4 \times 5} = \frac{15}{20} \quad \Bigg| \quad \frac{7 \times 2}{10 \times 2} = \frac{14}{20}$$

$$\frac{15}{20} > \frac{14}{20}$$

Since  **$\frac{3}{4} = \frac{15}{20} > \frac{14}{20} = \frac{7}{10}$** , we now know that  **$\frac{3}{4} > \frac{7}{10}$**

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## Common Denominators

Let's compare two more fractions by giving them a common denominator.  
Which is greater **5/8** or **4/6**?

We start by finding a common multiple.

Multiples of **8**: 8, 16, 24, 32, etc.

Multiples of **6**: 6, 12, 18, 24, etc.

**24** is a multiple of both **8** and **6**, so we choose it as our denominator.

Now we convert both 5/8 and 4/6 to twenty-fourths.

$$\frac{5}{8} = \frac{\quad}{24}$$

$$\frac{4}{6} = \frac{\quad}{24}$$

(8 x 3) = 24, so we multiply both the numerator and the denominator of 5/8 by 3. This gives **5/8 = 15/24**.

$$\begin{array}{r} 5 \times 3 = 15 \\ \hline 8 \times 3 = 24 \end{array}$$

(6 x 4) = 24, so we multiply both the numerator and the denominator of 4/6 by 4. This gives **4/6 = 16/24**.

$$\begin{array}{r} 4 \times 4 = 16 \\ \hline 6 \times 4 = 24 \end{array}$$

**16/24 > 15/24 → 4/6 > 5/8.**

1. Change to 'like' fractions and compare using the symbols {<, >, =}.

$$1/2 \quad \underline{\quad} \quad 5/8$$

$$2/3 \quad \underline{\quad} \quad 7/9$$

$$4/15 \quad \underline{\quad} \quad 1/3$$

$$5/6 \quad \underline{\quad} \quad 7/10$$