

**Comparing Fractions:**

A. When comparing fractions, we often need to know which fraction is smaller or larger.

$$\frac{a}{b} \quad (?) \quad \frac{c}{d}$$

1. To solve this quickly you can use cross-multiplication to determine which fraction is smaller or larger:

$$ad \quad ? \quad bc$$

$$\frac{a}{b} \quad \begin{array}{c} \swarrow \searrow \\ \nearrow \nwarrow \end{array} \quad \frac{c}{d}$$

2. In other words, if  $ad > bc$  then the fraction on the left is larger. If  $ad < bc$ , then the fraction on the right is larger. If  $ad = bc$ , then the 2 fractions are equivalent.

Ex [1] Which is greater:  $\frac{5}{6}$  or  $\frac{7}{9}$ ?

- Using the rule of cross-multiplication we can compare  $9 \times 5$  and  $6 \times 7$ .
- $9 \times 5 = 45$ .
- $6 \times 7 = 42$ .
- Since  $45 > 42$ , the fraction on the left is greater.
- So the answer is  $\frac{5}{6}$ .

B. Sometimes instead of giving two fractions, the problem will give one fraction and one decimal. In problems like these, simply change the decimal to a fraction (it does not have to be in simplest terms) and compare using this method.

Ex [1] Which is smaller:  $.54$  or  $\frac{6}{11}$ ?

- You can change  $.54$  to  $\frac{54}{100}$  (there is no need to simplify).
- Using cross-multiplication we can compare  $54 \times 11$  and  $6 \times 100$ .
- $54 \times 11 = 594$
- $6 \times 100 = 600$ .
- Since  $594 < 600$ , the fraction (or in this case the decimal) on the left is smaller.
- The answer is  $.54$ .

- C. In problems like Ex [1] Part B, it would be faster if you knew that  $\frac{6}{11} = .5454\dots$ . Therefore, [memorizing the fractions](#) will be useful in situation like these.