

# HOW DOES THE CALCULATOR SIMPLIFY FRACTIONS?

1. Enter the fraction using the  $\underline{n}$  and  $\overline{d}$  keys.
2. Simplify the fraction by pressing **Simp**.
3. Record the simplified fraction.
4. Determine with what common factor the fraction was simplified.
5. If you observe the symbol  $\frac{N}{D} \rightarrow \frac{n}{d}$  above the answer the fraction can be simplified more.
6. Repeat steps 2, 3, and 4 until the fraction is completely simplified.
7. After the fraction is completely simplified, determine and record the greatest common factor from the list of factors.

$$\frac{9}{12} = \frac{3}{4}$$

Starting Fraction	Factor Used	Simplified Fraction	Factor Used	Simplified Fraction	Factor Used	Simplified Fraction	Greatest Common Factor of the N and D
$\frac{12}{18}$							
$\frac{24}{36}$							
$\frac{30}{60}$							
$\frac{42}{54}$							
$\frac{28}{42}$							
$\frac{168}{210}$							
$\frac{44}{60}$							
$\frac{70}{105}$							

Starting Fraction	Factor Used	Simplified Fraction	Factor Used	Simplified Fraction	Factor Used	Simplified Fraction	Greatest Common Factor of the N and D
$\frac{270}{315}$							
$\frac{105}{195}$							
$\frac{210}{350}$							
$\frac{210}{462}$							

Study your chart carefully.

Study the shaded columns. What numbers does the calculator use to simplify these fractions?

Study the shaded columns. What do you notice about the order in which the factors are chosen?

How can you determine the greatest common factor of the numerator and denominator?

# THINKING ABOUT THE GREATEST COMMON FACTOR

Try to simplify with the *Greatest Common Factor*.

1. Enter the fraction using the  $\frac{n}{d}$  and  $\bar{d}$  keys.
2. Determine and record the greatest common factor of the numerator and denominator.
3. Press **Simp** and the greatest common factor and then press **Enter**.
4. If you do not observe the  $\frac{N}{D} \rightarrow \frac{n}{d}$  you have successfully simplified the fraction. Record a 1 in the score column if you were successful in 1 step.
5. If you observe the  $\frac{N}{D} \rightarrow \frac{n}{d}$  you need to simplify more. Study the new fraction and try to find the greatest common factor.

$$\frac{27}{36} = \frac{3}{4}$$

Starting Fraction	Greatest Common Factor	Simplified Fraction	Second Greatest Common Factor	Simplified Fraction	Points Scored
$\frac{18}{48}$					
$\frac{27}{36}$					
$\frac{56}{72}$					
$\frac{24}{60}$					
$\frac{48}{56}$					
$\frac{40}{100}$					
$\frac{42}{48}$					
$\frac{48}{64}$					
$\frac{36}{72}$					
$\frac{48}{84}$					

**Homework Assignment:**

Write 5 fractions that all simplify to  $\frac{3}{4}$ . Describe the greatest common factor that would be used to simplify each fraction to  $\frac{3}{4}$ .

Write 5 fractions that all simplify to  $\frac{2}{3}$ . Describe the greatest common factor that would be used to simplify each fraction to  $\frac{2}{3}$ .

Simplify each of the following fractions using the greatest common factor.

- Always check to see that your answer is completely simplified.
- If you find your answer can be simplified, try to find the greatest common factor when you simplify the second time.

$$\frac{56}{84} =$$

$$\frac{36}{96} =$$

$$\frac{112}{144} =$$

$$\frac{60}{220} =$$

$$\frac{90}{144} =$$

## ANSWERS TO HOW DOES THE CALCULATOR SIMPLIFY FRACTIONS?

$$\frac{9}{12} = \frac{3}{4}$$

1. Enter the fraction using the  $\underline{n}$  and  $\overline{d}$  keys.
2. Simplify the fraction by pressing **Simp**.
3. Record the simplified fraction.
4. Determine with what common factor the fraction was simplified.
5. If you observe the symbol  $\frac{N}{D} \rightarrow \frac{n}{d}$  above the answer the fraction can be simplified more.
6. Repeat steps 2, 3, and 4 until the fraction is completely simplified.
7. After the fraction is completely simplified, determine and record the greatest common factor from the list of factors.

Starting Fraction	Factor Used	Simplified Fraction	Factor Used	Simplified Fraction	Factor Used	Simplified Fraction	Greatest Common Factor of the N and D
$\frac{12}{18}$	2	$\frac{6}{9}$	3	$\frac{2}{3}$			6
$\frac{24}{36}$	2	$\frac{12}{18}$	2	$\frac{6}{9}$	3	$\frac{2}{3}$	12
$\frac{30}{60}$	2	$\frac{15}{30}$	3	$\frac{5}{10}$	5	$\frac{1}{2}$	30
$\frac{42}{54}$	2	$\frac{21}{27}$	3	$\frac{7}{9}$			6
$\frac{28}{42}$	2	$\frac{14}{21}$	7	$\frac{2}{3}$			14
$\frac{168}{210}$	2	$\frac{84}{105}$	3	$\frac{28}{35}$	7	$\frac{4}{5}$	42
$\frac{44}{60}$	2	$\frac{22}{30}$	2	$\frac{11}{15}$			4
$\frac{70}{105}$	5	$\frac{14}{21}$	7	$\frac{2}{3}$			35

Starting Fraction	Factor Used	Simplified Fraction	Factor Used	Simplified Fraction	Factor Used	Simplified Fraction	Greatest Common Factor of the N and D
$\frac{270}{315}$	3	$\frac{90}{105}$	3	$\frac{30}{35}$	5	$\frac{6}{7}$	45
$\frac{105}{195}$	3	$\frac{35}{65}$	5	$\frac{7}{13}$			35
$\frac{210}{350}$	2	$\frac{105}{175}$	5	$\frac{21}{35}$	7	$\frac{3}{5}$	70
$\frac{210}{462}$	2	$\frac{105}{231}$	3	$\frac{35}{77}$	7	$\frac{5}{11}$	42

Study your chart carefully.

Study the shaded columns. What numbers does the calculator use to simplify these fractions?

The calculator uses prime numbers for the factors.

Study the shaded columns. What do you notice about the order in which the factors are chosen?

The calculator uses the prime numbers in numerical order. The calculator tries to simplify with 2 first, then moves to 3, then moves to 5, then moves to 7, etc. The calculator completely factors with 2 and then moves to 3, then to 7, etc. It skips by factors that are not factors of both numerator and denominator.

How can you determine the greatest common factor of the numerator and denominator?

Multiply all the factors together. If the factors are 2, 2, and 3 the greatest common factor is 12.

# ANSWERS TO THINKING ABOUT THE GREATEST COMMON FACTOR

Try to simplify with the Greatest Common Factor.

1. Enter the fraction using the  $\underline{n}$  and  $\overline{d}$  keys.
2. Determine and record the greatest common factor of the numerator and denominator.
3. Press **Simp** and the greatest common factor and then press **Enter**.
4. If you do not observe the  $\frac{N}{D} \rightarrow \frac{n}{d}$  you have successfully simplified the fraction. Record a 1 in the score column if you were successful in 1 step.
5. If you observe the  $\frac{N}{D} \rightarrow \frac{n}{d}$  you need to simplify more. Study the new fraction and try to find the greatest common factor.

$$\frac{27}{36} = \frac{3}{4}$$

Starting Fraction	Greatest Common Factor	Simplified Fraction	Second Greatest Common Factor	Simplified Fraction	Points Scored
$\frac{18}{48}$	6				1
$\frac{27}{36}$	9				1
$\frac{56}{72}$	8				1
$\frac{24}{60}$	12				1
$\frac{48}{56}$	8				1
$\frac{40}{100}$	20				1
$\frac{42}{48}$	6				1
$\frac{48}{64}$	16				1
$\frac{36}{72}$	36				1
$\frac{48}{84}$	12				1

### Homework Assignment:

Write 5 fractions that all simplify to  $\frac{3}{4}$ . Describe the greatest common factor that would be used to simplify each fraction to  $\frac{3}{4}$ .

Write 5 fractions that all simplify to  $\frac{2}{3}$ . Describe the greatest common factor that would be used to simplify each fraction to  $\frac{2}{3}$ .

Simplify each of the following fractions using the greatest common factor.

- Always check to see that your answer is completely simplified.
- If you find your answer can be simplified, try to find the greatest common factor when you simplify the second time.

$$\frac{56}{84} = \frac{2}{3}$$

$$\frac{36}{96} = \frac{3}{8}$$

$$\frac{112}{144} = \frac{7}{9}$$

$$\frac{60}{220} = \frac{3}{11}$$

$$\frac{90}{144} = \frac{5}{8}$$