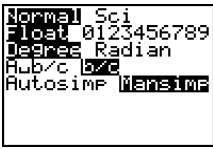
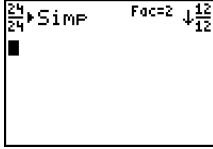
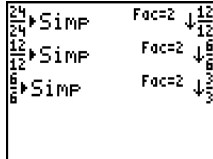


## Finding All Those Prime Factors

<b>Setting the Calculator</b>	
<b>Mode:</b> b/c and mansimp	
To prime factor 24 type <b>24 b/c 24 SIMP ENTER</b> Note the factor that the calculator used to simplify the fractions 24/24.	
Continue to simplify by pressing SIMP ENTER. Record the factors. Continue until you get all the prime factors.	

Use the SIMP key as illustrated to list all the prime factors for each number. Then complete the table by writing the prime factorization in two forms.

Number	Prime Factors	Prime Factorization	Prime Factorization using Powers
24	<b>2,2,2,3</b>	<b>2 x 2 x 2 x 3</b>	<b>2<sup>3</sup> x 3<sup>1</sup></b>
36	<b>2,2,3,3</b>	<b>2 x 2 x 3 x 3</b>	<b>2<sup>2</sup> x 3<sup>2</sup></b>
48	<b>2,2,2,2,3</b>	<b>2 x 2 x 2 x 2 x 3</b>	<b>2<sup>4</sup> x 3<sup>1</sup></b>
60	<b>2,2,3,5</b>	<b>2 x 2 x 3 x 5</b>	<b>2<sup>2</sup> x 3<sup>1</sup> x 5<sup>1</sup></b>
96	<b>2,2,2,2,2,3</b>	<b>2 x 2 x 2 x 2 x 2 x 3</b>	<b>2<sup>5</sup> x 3<sup>1</sup></b>
112	<b>2,2,2,2,7</b>	<b>2 x 2 x 2 x 2 x 7</b>	<b>2<sup>4</sup> x 7<sup>1</sup></b>
128	<b>2,2,2,2,2,2,2</b>	<b>2 x 2 x 2 x 2 x 2 x 2 x 2</b>	<b>2<sup>7</sup></b>
175	<b>5,5,7</b>	<b>5 x 5 x 7</b>	<b>5<sup>2</sup> x 7<sup>1</sup></b>
225	<b>3,3,5,5</b>	<b>3 x 3 x 5 x 5</b>	<b>3<sup>2</sup> x 5<sup>2</sup></b>
378	<b>2,3,3,3,7</b>	<b>2 x 3 x 3 x 3 x 7</b>	<b>2<sup>1</sup> x 3<sup>3</sup> x 7<sup>1</sup></b>
462	<b>2,3,7,11</b>	<b>2 x 3 x 7 x 11</b>	<b>2<sup>1</sup> x 3<sup>1</sup> x 7<sup>1</sup> x 11<sup>1</sup></b>
888	<b>2,2,2,3,37</b>	<b>2 x 2 x 2 x 3 x 37</b>	<b>2<sup>3</sup> x 3<sup>1</sup> x 37<sup>1</sup></b>

Questions:

1. When you press SIMP ENTER what is the calculator doing?

Simplifying the fraction using the lowest prime number that is a factor of the number you are using.

2. Check the prime factorization using your calculator.  
On the unshaded rows use the normal prime factorization.  
On the shaded rows use the power form for the prime factorization.
3. After using the calculator to create the prime factorization what new ideas do you have for creating the prime factorization without a calculator?

Answers will vary

4. When you write the prime factorization of 24 as  $2^3 \times 3^1$  what do you mean by  $2^3$ ?

$2 \times 2 \times 2$

5. Does  $2^3$  mean the same as  $3^2$ ? Why or why not?

No,  $2^3 = 2 \times 2 \times 2$  and  $3^2 = 3 \times 3$