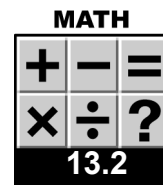


Name: \_\_\_\_\_

Date: \_\_\_\_\_



## 13.2 Finding the Least Common Multiple

**READ**


Knowing how to find the least common multiple of two or more numbers is helpful in physical science classes. You need to find the least common multiple in order to add fractions with different denominators, or to predict the chemical formula of many common compounds.

### EXAMPLE

The least common multiple is the smallest multiple of two or more whole numbers. To find the least common multiple of 3 and 4, simply list the multiples of each number:

multiples of 3: 3, 6, 9, 12, 15...

multiples of 4: 4, 8, 12, 16, 20...

Then, look for the smallest multiple that occurs in both lists. In this case, the least common multiple is 12.

### EXAMPLE

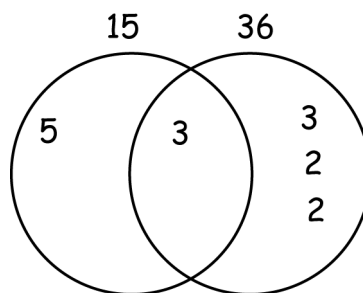
Sometimes it's a little trickier to find the least common multiple. Suppose you are asked to find the least common multiple of 15 and 36. Rather than making a long list of multiples, you can use the prime factorization method.

First, factor each number into primes (remember that prime numbers are numbers that can't be divided evenly by any whole number except one).

Prime factorization of 15:  $3 \times 5$

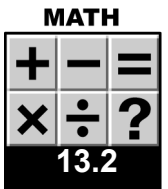
Prime factorization of 36:  $3 \times 3 \times 2 \times 2$

Next, create a Venn diagram. Show the factors unique to each number in the separate parts of the circles and the factors common to both in the overlapping circles. Since 15 and 36 each have one 3, put one 3 in the middle.



Finally, multiply all the factors in your diagram from left to right:

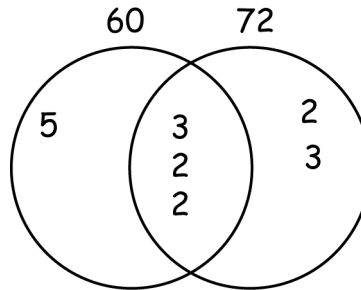
$5 \times 3 \times 3 \times 2 \times 2 = 180$ . The least common multiple of 15 and 36 is 180.

**EXAMPLE** 

Important note: If the two numbers each have more than one copy of a certain prime factor, place the factor in the overlapping circles as many times as necessary. To find the least common multiple of 60 and 72:

Prime factorization of 60:  $2 \times 2 \times 3 \times 5$

Prime factorization of 72:  $2 \times 2 \times 3 \times 2 \times 3$



Notice that 2 appears twice in the overlapping circles because 60 and 72 have two 2's apiece.

$5 \times 3 \times 2 \times 2 \times 2 \times 3 = 360$ . The least common multiple of 60 and 72 is 360.

**PRACTICE** 

Find the least common multiple of each of the following pairs of numbers:

1. 3 and 7
2. 6 and 8
3. 9 and 15
4. 10 and 25
5. 16 and 40
6. 21 and 49
7. 36 and 54
8. 45 and 63
9. 55 and 80
10. 64 and 96