

MATH DOESN'T SUCK



Solution Guide – Chapter 3 Lowest Common Multiple (LCM)

Doing the Math from p. 28

These are just a matter of remembering your multiplication facts; the important thing is to recognize that these are *multiples*.

2) 5: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50

3) 7: 7, 14, 21, 28, 35, 42, 49, 56, 63, 70

4) 12: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120

Doing the Math from p. 31-32

2) 9 and 12

First, list the first few multiples, and then we'll underline the ones they have in common.

9: 9, 18, 27, 36, 45, 54, 63, 72

12: 12, 24, 36, 48, 60, 72

There will be more, bigger multiples they share in common (like 108, for example) but we only care about finding the smallest one they share in common, so we could have actually stopped after we found 36.

Answer: The Least (smallest) multiple of 9 and 12 is 36.

Now, let's draw the birthday cake and we should get the same answer. We know that 3 divides into both 9 and 12, so let's use that first:

$$\begin{array}{r|l} 3 & 9 \quad 12 \\ & 3 \quad 4 \end{array}$$

There are no more common factors, so we stop and now we can multiply the numbers along the “L” shape to find the LCM: $3 \times 3 \times 4 = 36$. Yep! We got the same answer for the LCM with both methods. Good thing, huh?

3) 6 and 7

First, we’ll list the first few multiples:

6: 6, 12, 18, 24, 30, 36, 42, 48

7: 7, 14, 21, 28, 35, 42, 49

We don’t have to keep going, because we’ve found a common multiple, and any other common multiples we might find would be bigger anyway – and we want the *smallest* common multiple.

Answer: The LCM of 6 and 7 is 42.

Now, for the birthday cake method:

$$\begin{array}{r|l} 1 & 6 \quad 7 \\ & 6 \quad 7 \end{array}$$

Since 6 and 7 have no common factors (in other words, they are relatively prime), let’s just put a “1” on the side, and multiply our “L” shape.

$LCM = 1 \times 6 \times 7 = 42$. Great, we got the same answer, like we should!

4) 4 and 16

Listing the first few multiples, until you see something in common:

4: 4, 8, 12, 16, 20

16: 16, 32, 48

Answer: The LCM of 4 and 16 is 16.

Birthday cake method:

We know that 4 is a factor of 4 and 16, so let's use that:

$$\begin{array}{r|l} 4 & 4 \quad 16 \\ \hline & 1 \quad 4 \end{array}$$

The numbers 1 and 4 don't have any common factors, so it's time to multiply our "L" shape to get the LCM: $4 \times 1 \times 4 = 16$.

Both methods give us the same answer, 16!

5) 9 and 15

Listing the first few multiples, until you see something in common:

9: 9, 18, 27, 36, 45, 54, 63

15: 15, 30, 45, 60

Answer: The LCM of 9 and 15 is 45.

Birthday cake method: We know that 3 divides into both 9 and 15, so let's use 3:

$$\begin{array}{r|l} 3 & 9 \quad 15 \\ \hline & 3 \quad 5 \end{array}$$

The numbers 3 and 5 don't have any factors in common, so it's time to multiply the numbers along the "L" shape to get the LCM: $3 \times 3 \times 5 = 45$.