



## Division: Notes

### What is division?

- Division **splits a number into a number of equal groups**
  - For example, 8 divided by 4 = 2
    - There are 4 groups of 2 in 8. You can check this with multiplication:  $2 \times 4 = 8$ . You can also check with addition:  $2 + 2 + 2 + 2 = 8$ . There are 4 groups of 2!
- When the **dividend is divided by the divisor to make the quotient (final answer)**
  - In the problem above, the dividend is 8, the divisor is 4, and the quotient is 2.

### Dividend

### Divisor

= Quotient

8

4

= 2

### What will it look like?

- Division appears in **3 forms**:
  - Dividend  $\div$  divisor    Most common division sign
  - Dividend / divisor    Another sign for division, looks like a fraction
  - Divisor  $\overline{)$  Dividend    long division

### How to divide?

- Dividing is simply **splitting a number into a number of equal groups**. The dividend is split into the number of groups that the divisor is.
  - If the dividend was 9 and the divisor was 3, that would mean to solve the problem, a person has to split 9 into 3 groups. The answer, or the quotient, would be 3, because  $3 + 3 + 3 = 9$ .
  - If the dividend was 10 and the divisor was 5, the answer would be two, because  $10 = 2 + 2 + 2 + 2$ .
- You should **try to remember your division tables just like you do your multiplication tables**, because then you won't have to think very hard when you encounter a simple division problem

## How do I long divide?

- Division gets more complicated
  - Sometimes numbers don't come out even when divided
  - Sometimes numbers are too large to be remembered as fast facts, for a fast facts chart, look below
- For larger numbers, there is something called long division.
- Long division looks like this:
  - **Divisor**  $\overline{)$  **Dividend**

### How-to:

**Long Division!**

Problem:  $954,525 \div 25$   
Dividend  $\div$  divisor

Step 1:  $25 \overline{) 954,525}$  take the divisor and see how many times it occurs in the dividend. In this case, 25 occurs zero times in 9, write the number it occurs on top of the bar.

Step 2:  $25 \overline{) 954,525}$  25 goes into 95 3 times.

Step 3:  $25 \overline{) 954,525}$   $25 \times 3 = 75$ , so you subtract 75 from 95.  $95 - 75 = 20$ . 25 does not go into 20, so you bring 4 down, as it is the next digit.

Step 4:  $25 \overline{) 954,525}$  25 goes into 204 8 times.

Step 5:  $25 \overline{) 954,525}$   $8 \times 25 = 200$

Step 6:  $25 \overline{) 954,525}$

Step 7: 
$$\begin{array}{r} 038 \\ 25 \overline{) 954,525} \\ \underline{-75} \phantom{00} \\ 204 \phantom{00} \\ \underline{-200} \phantom{00} \\ 4 \phantom{00} \end{array}$$

subtract  $25 \times 8 = 200$   
from 204, and  
you get 4.  
Then, because  
25 does not  
go into 4,  
bring down  
the next digit,  
5.

THIS IS  
YOUR  
ANSWER!  $\boxed{038,181}$

Step 8: 
$$\begin{array}{r} 0381 \\ 25 \overline{) 954,525} \\ \underline{-75} \phantom{00} \\ 204 \phantom{00} \\ \underline{-200} \phantom{00} \\ 45 \phantom{00} \\ \times \phantom{00} \\ \underline{0381} \phantom{00} \\ 25 \overline{) 954,525} \\ \underline{-75} \phantom{00} \\ 204 \phantom{00} \\ \underline{-200} \phantom{00} \\ 45 \phantom{00} \\ \underline{-25} \phantom{00} \\ 20 \phantom{00} \\ \underline{-200} \phantom{00} \\ 25 \phantom{00} \\ \underline{-25} \phantom{00} \\ \boxed{00} \phantom{00} \end{array}$$

25 goes into  
45 1 time  
continue the pattern  
until...

you see this!  
or you  
see a  
remainder

zero!

- Here is another picture example of what a long division problem might look like:



$$\begin{array}{r} 109 \\ 594 \overline{) 65284} \\ \underline{594} \phantom{00} \\ 5884 \\ \underline{5346} \phantom{00} \\ 538 \end{array}$$

- 65,284 is the dividend, 594 is the divisor, and 109 is the quotient. OR SO YOU MIGHT THINK! If you look at the bottom of this equation, you can see that there is still 538. 538 cannot be divided by 594 without producing a number that is not a whole number, and in this situation, we want a whole number. Therefore, the answer to this equation would be 109 remainder: 538. When you get more advanced in math, you can actually solve the equation into the decimal points by bringing down zeros in the decimals of 65,284, but you don't have to worry about that for now, and can just leave the remainder when you run out of digits in the dividend to bring down.



## Division chart

**Directions:** The dark grey part of the chart holds the dividends, the light gray part holds the divisors, and the white part holds the quotients. Some of the answers will be fractions, so if you do not know anything about those, you should go to the fractions lesson. It is more important that you know your multiplication fast facts, as you can just reverse them to remember division.

For example: You know  $6 \times 4 = 24$ , which means you also know  $24 \div 6 = 4$  and  $24 \div 4 = 6$

$\div$	1	2	3	4	5	6	7	8	9	10	11	12
1	1	$1/2$	$1/3$	$1/4$	$1/5$	$1/6$	$1/7$	$1/8$	$1/9$	$1/10$	$1/11$	$1/12$
2	2	1	$2/3$	$1/2$	$2/5$	$1/3$	$2/7$	$1/4$	$2/9$	$1/5$	$2/11$	$1/6$
3	3	$3/2$	1	$3/4$	$3/5$	$1/2$	$3/7$	$3/8$	$1/3$	$3/10$	$3/11$	$1/4$
4	4	2	$4/3$	1	$4/5$	$2/3$	$4/7$	$1/2$	$4/9$	$4/10$	$4/11$	$1/3$
5	5	$5/2$	$5/3$	$5/4$	1	$5/6$	$5/7$	$5/8$	$5/9$	$1/2$	$5/11$	$5/12$
6	6	3	2	$3/2$	$6/5$	1	$6/7$	$3/4$	$2/3$	$6/10$	$6/11$	$1/2$
7	7	$7/2$	$7/3$	$7/4$	$7/5$	$7/6$	1	$7/8$	$7/9$	$7/10$	$7/11$	$7/12$
8	8	4	$8/3$	2	$8/5$	$4/3$	$8/7$	1	$8/9$	$4/5$	$8/11$	$4/6$
9	9	$9/2$	3	$9/4$	$9/5$	$3/2$	$9/7$	$9/8$	1	$9/10$	$9/11$	$3/4$
10	10	5	$10/3$	$5/2$	2	$5/3$	$10/7$	$5/4$	$10/9$	1	$10/11$	$5/6$
11	11	$11/2$	$11/3$	$11/4$	$11/5$	$11/6$	$11/7$	$11/8$	$11/9$	$11/10$	1	$11/12$
12	12	6	4	3	$12/5$	2	$12/7$	$6/4$	$4/3$	$6/5$	$12/11$	1