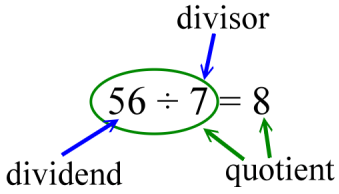
Division Terms and Division with Zero

Study the terms in the picture.

Notice: both the expression 56 ÷ 7 and its answer are called "the quotient"!

You can call "56 ÷ 7" the quotient written, and the 8 as the quotient solved.



1. What is missing from these divisions: the dividend, the divisor, or the quotient? Complete.

a. 80 ÷ _____ = 40 The _____ is missing.

b. _____ ÷ 7 = 5 The _____ is missing.

c. 120 ÷ 10 = _____ The _____ is missing.

2. Write the division problem. Solve for the unknown.

a. The divisor is 7, the dividend is *x*, and the quotient is 3.	_____ ÷ _____ = _____ ; x = _____
b. The dividend is 140, the divisor is *y*, and the quotient is 7.	_____ ÷ _____ = _____ ; y = _____
c. The quotient is *z*, the divisor is 5, and the dividend is 150.	_____ ÷ _____ = _____ ; z = _____

3. Make up:

a. three division problems with a quotient of 6	**b.** three division problems with a dividend of 24
_____ ÷ _____ = _____	_____ ÷ _____ = _____
_____ ÷ _____ = _____	_____ ÷ _____ = _____
_____ ÷ _____ = _____	_____ ÷ _____ = _____

4. Fill in the tables. Remember, the product of two numbers means they are multiplied.

Numbers	Product (written)	Product (solved)	Quotient (written)	Quotient (solved)
12 and 3	*12 × 3*	*36*		
10 and 5				
20 and 4				
100 and 10				

Division with zero

We check a division problem by multiplication.
Is 0 ÷ 3 = 0? Check if 0 × 3 = 0. Yes, it is.
Is 0 ÷ 11 = 0? Check if 0 × 11 = 0. Yes, it is.

Is 3 ÷ 0 = 0? Check if 0 × 0 = 3. It is **not**.

Is 3 ÷ 0 perhaps 3? Check if 0 × 3 = 3. It is **not**.

In fact, dividing by zero is a real problem. No matter what number you suggest as an answer to the problem 3 ÷ 0, the multiplication check won't work because you'll end up multiplying by zero, and can never get the dividend as an answer.

What about 0 ÷ 0?

We cannot really determine any single answer, because all of these could work:

If 0 ÷ 0 = 1, then check: 0 × 1 = 0 works.
If 0 ÷ 0 = 7, then check: 0 × 7 = 0 works.
If 0 ÷ 0 = 0, then check: 0 × 0 = 0 works.

So 0 ÷ 0 is usually said to be an *indeterminate* form since we cannot determine an answer to it.

That is why division **by zero** is said to be an *undefined*—we cannot define a sensible answer. You can, however, divide zero by any number (except zero). The answer is always zero.

Division by zero is undefined—you cannot do it.

5. Divide. Mark off the problem if it is impossible to do.

a. 64 ÷ 8 = _____	**b.** 55 ÷ 5 = _____	**c.** 50 ÷ 1 = _____	**d.** 0 ÷ 1 = _____
0 ÷ 8 = _____	6 ÷ 0 = _____	0 ÷ 10 = _____	1 ÷ 1 = _____
32 ÷ 32 = _____	7 ÷ 7 = _____	0 ÷ 0 = _____	9 ÷ 0 = _____

6. Find what the unknown stands for.

a. 64 ÷ x = 1	**b.** 35 ÷ T = 35	**c.** 0 ÷ x = 0	**d.** y ÷ 18 = 1
x = _____	T = _____	x = _____	y = _____

7. Make up:

a. two divisions with a quotient of 1	**b.** two divisions with a dividend of 0
_____÷ _____ = _____	_____÷ _____ = _____
_____÷ _____ = _____	_____÷ _____ = _____

Mark had two division problems with the same dividend and the same quotient, yet the divisors were different. How could that be?

Puzzle Corner