

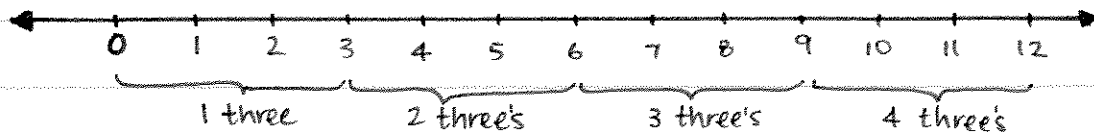
THE QUOTIENT

↳ The mathematical symbol for division is \div .
Notice that the symbol closely resembles a fraction. This is because _____

Why is $\frac{12}{3} = 4$?

↳ $\frac{12}{3} = 4$ since _____ = _____

NOTE: It takes 4 "three's" to make 12.
This can be seen on the number line:



↳ EXAMPLE 1:
 $9 \cdot 8 = 72$

This implies:

$$\frac{72}{9} = \underline{\quad} \quad \text{and} \quad \frac{72}{8} = \underline{\quad}$$

↳ EXAMPLE 2:

$$\frac{30}{5} = \underline{\quad} \quad \text{since} \quad 5 \cdot \underline{\quad} = 30$$

LONG DIVISION:

CONSIDER $128 \div 4$

$$4 \overline{) 128}$$

How many times does 4 go into 1?

ZERO.

$$\begin{array}{r} 0 \\ 4 \overline{) 128} \end{array}$$

How many times does 4 go into 12?

THREE.

$$\begin{array}{r} 03 \\ 4 \overline{) 128} \end{array}$$

$$\begin{array}{r} 03 \\ 4 \overline{) 128} \\ - 12 \end{array} \quad \leftarrow 3 \times 4 \text{ goes here}$$

$$08 \quad \leftarrow \text{then SUBTRACT}$$

↑ bring down the 8

How many times does 4 go into 8?

TWO.

$$\begin{array}{r} 032 \\ 4 \overline{) 128} \end{array}$$

$$\begin{array}{r} 032 \\ 4 \overline{) 128} \\ - 12 \end{array}$$

$$08$$

$$\begin{array}{r} 08 \\ - 8 \end{array} \quad \leftarrow 2 \times 4 \text{ goes here}$$

$$0 \quad \leftarrow \text{then subtract}$$

↑ zero implies that 4 goes
into 128 evenly

↳ SO, $128 \div 4 =$ _____

This implies that

$$\cdot \frac{128}{4} = \underline{\hspace{2cm}}$$

$$\cdot 32 \cdot 4 = \underline{\hspace{2cm}}$$

$$\cdot \frac{128}{32} = \underline{\hspace{2cm}}$$

↳ EXAMPLE 3:

$$11 \div 3$$

NOTE: $11 \div 3$ can also be written $\frac{11}{3}$

Looking at the number line:



how many groups of three can fit
in 11? _____ whole groups, with
_____ units left over.

In math, this is written _____ R _____
(R stands for "remainder")

Therefore $11 \div 3 =$ _____

Another approach:
Long division:

↳

$$3 \overline{) 11}$$

DIVISION AND ZERO

RECALL: $\frac{6}{3} = 2$ implies $3 \cdot 2 = 6$

With this in mind, consider

$$\frac{0}{5}$$

To evaluate $\frac{0}{5}$, we ask, "5 times

what number equals zero?"

↳

The answer is _____.

With this in mind, we can make the following statement:

↳

Zero divided by any number (except zero) is always _____.

RECALL: $\frac{6}{3} = 2$ implies $3 \cdot 2 = 6$

with this in mind, consider

$$\frac{5}{0}$$

To evaluate $\frac{5}{0}$, we ask, "0 times

what number equals 5?"

↳ Since 0 times ANY NUMBER is always _____, there is no answer. In math we say that $\frac{5}{0}$ is UNDEFINED.

With this in mind, we can make the following statement:

↳ ANY number divided by zero is always _____.

The quotient

↳ The word quotient always implies

↳ example 4:

Write "The quotient of 14 and 7"
in math.

ANSWER: _____

OR _____

NOTE: The order is very important!

↳ example 5:

Write $c \div d$ in a word statement

ANSWER: _____

↳ example 6:

Write "The quotient of a and b"
in math.

ANSWER: _____

OR _____

↳ example 7:

Write $10 \div 2 = 5$ as an equivalent
multiplication statement.

ANSWER: _____

↳

EXAMPLE 8:

What number do you multiply by
5 to get 45?

$$\underline{\quad} \cdot 5 = 45$$

Therefore the answer is _____.

The QUOTIENT Practice Problems

1. $3 \cdot 5 = 15$ implies $\frac{15}{\square} = 3$ and $\frac{15}{\square} = 5$

2.
$$\frac{42}{6}$$

3. $17 \div 5$

4.
$$\frac{0}{37}$$

5.
$$\frac{37}{0}$$

6. Write "The quotient of 5 and 2" in math.

7. Write $27 \div 9$ as a word statement.

8. What number do you multiply by 3 to get 21?