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MATH 1350
Math for Elem. School Teachers
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Division:

Definition of whole number division:

Let $m, K, \& n$ be whole numbers, w/ $n \neq 0$

Suppose $m = K \cdot n$, i.e., m is a multiple of n

Define $m \div n$ to be the whole number K,

so that $m = K \cdot n$.

Notice something:

These two statements are equivalent

$$m \div n = K$$

&

$$m = K \cdot n$$

Because $K \cdot n = \underbrace{n+n+\ldots+n}_{K \text{ times}}$, we can interpret $m \div n$ as the ~~m~~ number of groups of objects when you put m objects into groups of size n.

Ex.

$100 \div 5 = 20$

$100 = \underbrace{5+5+5+\ldots+5}_{20 \text{ times}}$

$100 = 20 \cdot 5 = 5 \cdot 20 = 20+20+20+20+20$

$100 \div 5$

We can think of the 5 as the number of groups are the size of the groups,

If 5 is the number of groups then 20 is the size. If 5 is the size then 20 is the number of objects in each group

What is the meaning of $25 \div 6$?

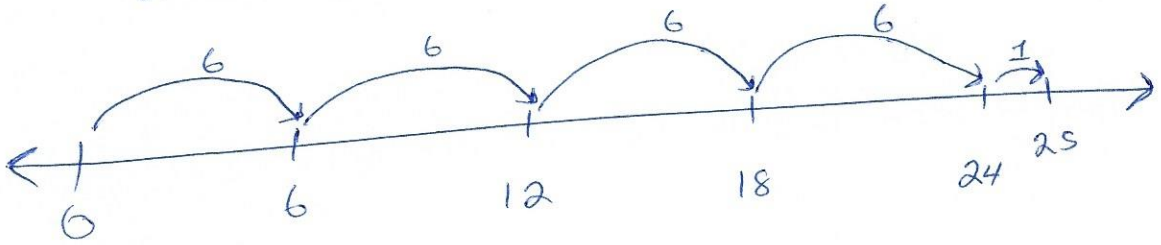
This has NO MEANING presently with our current def'n.

We need fractions to cover the remainder.

Division w/ Remainder:

$25 \div 6$

$25 = 4 \cdot 6 + 1$



The remainder must be smaller than the the number/size of groups.

Otherwise, it would form another group.

If a and d are whole numbers, $d \neq 0$,

then one can find whole numbers q & r

so, that

$a = q \cdot d + r$,

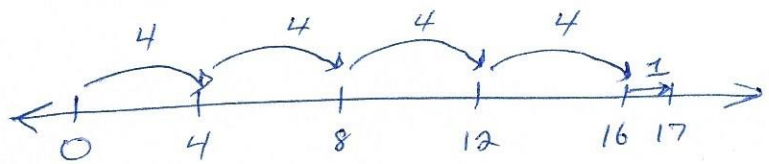
and $0 \leq r < d$.

Ex.

(i.) Find quotient and remainder using division-with-remainder for

$17 \div 4$

$17 \div 4 = 4 \cdot 4 + 1$



So, 4 groups of 4 with a remainder of 1.

$2^2 144$
$\times 5$
720
$+132$
852
$+10$
862

$90\heartsuit 2 + \heartsuit\diamond\heartsuit$

~~9000~~

$\overset{1\,1}{90\heartsuit 2}$
$+\heartsuit\diamond\heartsuit$
$90\heartsuit 0$