modular arithmetic:

$a \equiv b \bmod m \iff m \mid b-a$

"is congruent to"

equivalently if $a = q \cdot m + b$

eg hours

$2 \equiv 14 \bmod 12$

$2 \equiv 26 \bmod 12$

$12 \mid \underbrace{26-2}_{= 24}$

Typically we will always use the smallest numbers possible,

eg

$$a \equiv r \bmod m \iff a = qm + r$$

with

$$0 \le r < m$$

Nice truth:

if $a \equiv b \bmod m$ and $c \equiv d \bmod m$

then $a+c \equiv b+d \bmod m$

and $ac = bd \bmod m$

division is tricky . . .

Reason funny things can happen...

~~eg~~

$$8 \cdot 6 \equiv 48 \mod 24$$

So $$8 \cdot 6 \equiv 0 \mod 24$$

possible to have two non zeros numbers whose product is zero.

observe

$$k \cdot m \equiv 0 \mod m \quad \text{for any } k$$