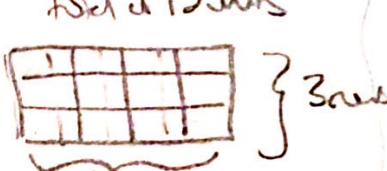
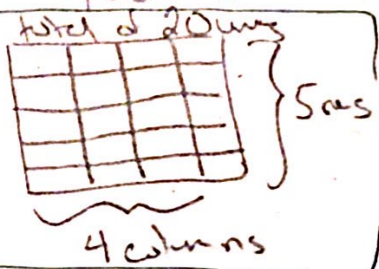
Show/Explain why if n divides a and n divides b then n divides (a+b).

Lets run through an example first.
Lets let $n=4$, $a=12$ and $b=20$.

Notice n divides a that is 4 divides 12 since $3 \times 4 = 12$. We can see this with a repeated addition model for making a rectangle

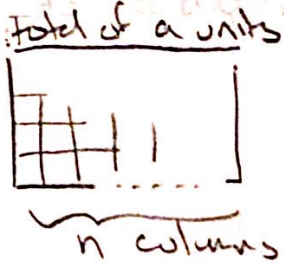


Similarly since 4 divides 20 we can form a rectangle with 4 columns (and 5 rows).

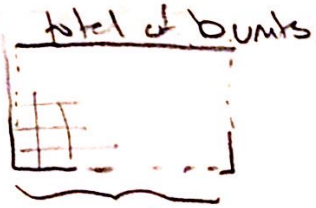


The sum $12+20$ can be seen by stacking the two rectangles on top of each other. Notice the sum (32) forms a rectangle with 4 columns so 4 divides $(12+20)$.

Lets generalize now?
Since n divides a we can take a units and form a rectangle with n columns.



Since n divides b we can take b units and form a rectangle with n columns.



To add a+b we can stack the rectangles on top of each other. Notice the line up well with n columns on each piece making 1 large rect. of a+b units with n columns. Thus n divides a+b. !!