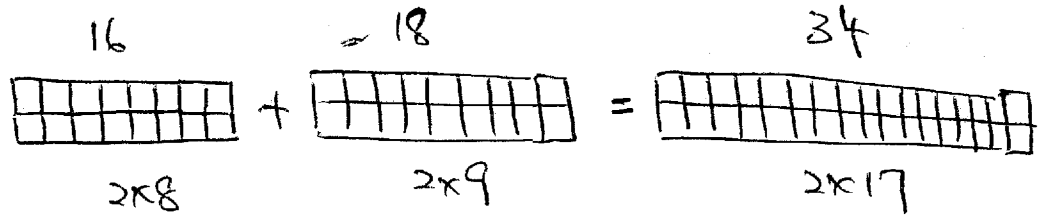
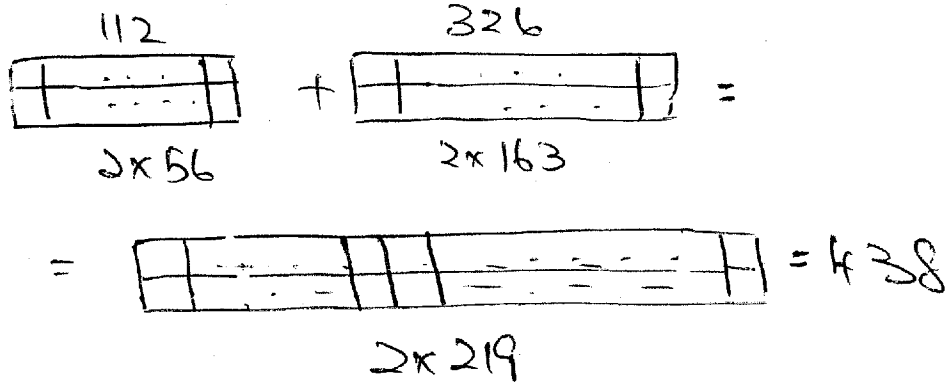
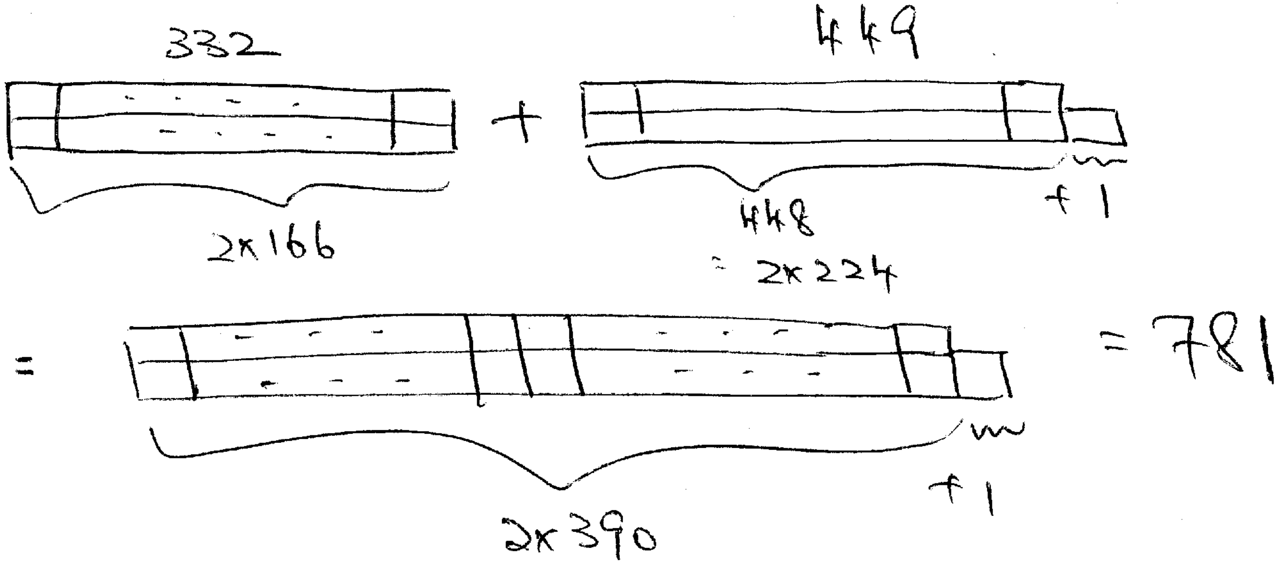
1) $16 + 18$
$= 34$



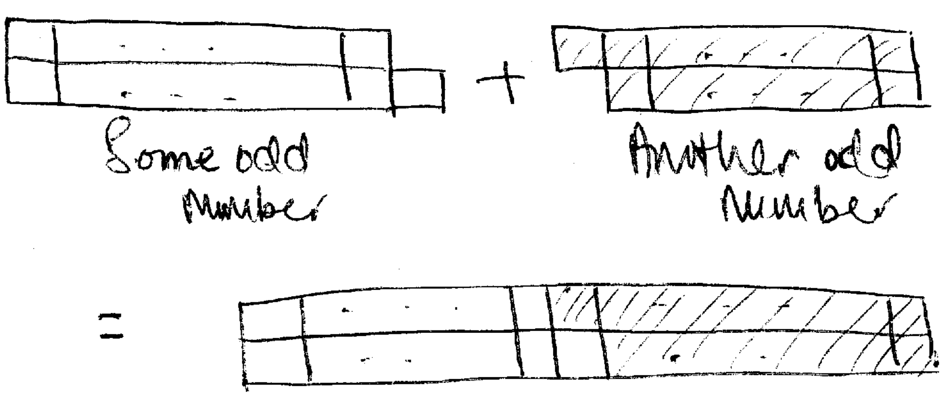
$112 + 326$
$= 438$



2) $332 + 449 = 781$



4(a)



Total is even!

4 (b) Represent two odd numbers by $2k+1$ and $2m+1$, where k and m are whole numbers.

Then $(2k+1)+(2m+1)$

$= 2k+2m+1+1$ any order property

$= 2(k+m)+2$ distributive property

$= 2(k+m+1)$ distributive property

which is an even number.

5) Take any whole number A and divide it by 2.
By Quotient - Remainder Theorem (p35),

$A = 2q + r$ where $0 \le r < 2$.

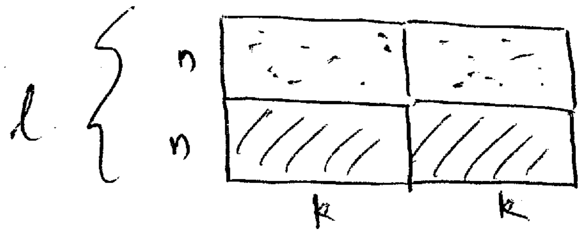
Since r must be a whole number, r has only two choices: 0 or 1

If $r=0$, then $A = 2q$ which means A is even.

If $r=1$, then $A = 2q+1$ which means A is odd.

6) (a) let the two even numbers be $2k$ and $2n (= l)$

picture proof



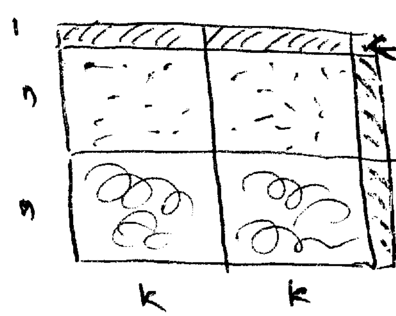
even!

Algebraic Proof:

The product of an even no. $2k$ with a no. l is: $2k \cdot l = 2(kl)$ by the associative property of multiplication, and $2(kl)$ is twice a whole number, so it is even.

(c) let the two odd numbers be $2k+1$ and $2n+1$.

picture proof



odd part.

algebraic proof

$(2k+1)(2n+1) = 2k(2n+1) + 1(2n+1)$ distributive property

$2(2kn)$ from part (b)

$= 2k \cdot 2n + 2k + 2n + 1$ distributive property

$= 2(2kn + k + n) + 1$ distributive property

which is odd!

7)(a) Suppose A is even. Then $A = 2M$ where M is a whole number.

If B is even, then $B = 2k$ where k is also a whole number

$$A + B = 2M + 2k$$
$$= 2(M + k) \quad \text{(distributive property)}$$

which is even.

(b) Suppose A is even. Then $A = 2m$ where m is a whole number.

If $A+B$ is even, then $A+B = 2l$ where l is also a whole number.

$$B = (A+B) - A$$
$$= 2l - 2M$$
$$= 2(l-M) \quad \text{distributive property}$$

which is even