

## (Math 170) Homework 6:

Due February 23, 2007

Exercise 1: Prove we can define in clock arithmetic

$$[a] \times [b] = [a \times b]$$

in a consistent manner. In other words if  $[a] = [c]$  and  $[b] = [d]$  then

$$[a] \times [b] = [c] \times [d]$$

(where  $[a] = \{12k + a : k \in \mathbb{Z}\}$ )

Exercise 2: What is the 16th row of Pascal's triangle? What do these sum up to?

Exercise 3: Expand  $(2^{-x} + 3^x)^{12}$

Exercise 4: Factorize

– 120

– 101

– 133

– 144

– 121

– 201

Exercise 5: What are the first 32 rows of Pascal's triangle mod 2 (i.e. the remainders of each entry when divided by 2). Omit the initial 0's on either side. i.e. the first row should be

1

not

$\dots 0, 0, 0, 1, 0, 0, 0, \dots$

What does this look like?