4.6

6) There is no greatest neg real number
There is a greatest neg reel number
Let a be the greatest neg real number
$a < 0 \quad a \geq x \quad 0 < \frac{1}{2} < 1 \quad 0 > \frac{a}{2} > a$

11) Prove by contradiction
The product of any nonzero rational number and any irrational number is irrational
$\exists$ a rational number r, with $r \neq 0$ and an irrational number S such that rs is rational
Proof: assume statement is false and the negation is true assume r is a rational number $r \neq 0$ & s is an irrational number & rs is rational
$r = \frac{a}{b}$ and $rs = \frac{c}{d}$ then $\left(\frac{a}{b}\right)s = \frac{c}{d}$ then $\left(\frac{b}{a}\frac{a}{b}\right)s = \left(\frac{b}{a}\right)\frac{c}{d}$
$s = \frac{bc}{ad}$ s has been writen as a quotient of INT and is rational

28) For all INT m and n, if mn is even then m is even and n is even
$m = 2r + 1$
$n = 2s + 1$
$mn = (2r+1)(2s+1)$
$mn = 4rs + 2r + 2s + 1$
$mn = 2(2rs + r + s) + 1$
mn is odd