

MAT 119
Quiz #8
10 November 2005

Name: Key

You may not use your notes. Please show all of your work. An answer without justification will receive little credit.

(1) Compute $\binom{4}{3}$.

(5)
$$\binom{4}{3} = \binom{6}{3} = \frac{6 \cdot 5 \cdot 4}{3!} = 20$$

(2) Prove by contradiction that if p , q and $p + q$ are all prime then either p or q must be 2.

Proof: (2) For the sake of contradiction assume that p, q and $p+q$ are all prime and that p and q are ~~not~~ not 2.

Then p, q are odd primes and $p > 2; q > 2$

(2) $\Rightarrow p+q > 4$ and $p+q$ is even

since p and q are both odd.

(1) Thus $p+q$ cannot be prime because $2 \mid (p+q)$ and $p+q \neq 2$.

This contradicts our assumption. $\Rightarrow \times$