

PRIME NUMBER

Kus Prihantoso Krisnawan

May 24, 2012

Department of Mathematic Education
Yogyakarta State University

Prove each of the assertions below:

- 1 The only prime of the form $n^3 - 1$ is 7.
(Hint: use the equation $n^3 - 1 = (n - 1)(n^2 + n + 1)$)
- 2 The only prime p for which $3p + 1$ is a perfect square is $p = 5$.
- 3 The only prime of the form $n^2 - 4$ is 5.
- 4 If $p \geq 5$ is a prime number, show that $p^2 + 2$ is composite.
(Hint: p takes one of the forms $6k + 1$ or $6k + 5$).
- 5 Every integer of the form $n^4 + 4$, with $n > 1$, is composite.
- 6 If $p \neq 5$ is an odd prime, prove that either $p^2 - 1$ or $p^2 + 1$ is divisible by 10.