

Exercises Involving Real Numbers #2

FALL 2005

Pat Rossi

Name _____

Instructions. Prove or Disprove:

1. Let n be a number with three or more digits. If the two digit number made by n 's last two digits is divisible by 4, then n is divisible by 4
2. If $(a + b)^2 = a^2 + b^2$ for all real numbers b , then a must be zero.
3. Let n be a natural number. If the number $2^n - 1$ is a prime number, then n is a prime number as well.
4. Every four digit palindrome number is divisible by 4. (A palindrome number reads the same forward or backward.)

For 5 - 6, prove:

5. Show that if x is a real number, then $x \cdot 0 = 0$ by giving a direct proof. You can assume the following: If a , b , and c are real numbers, then
 - (a) $b + 0 = b$
 - (b) $a(b + c) = ab + ac$
6. If $a + b = a + c$ then $b = c$