

Red Belt
Warm-Up
Wednesday October 12, 2005

1. Goldbach's Conjecture: Every even number greater than 2 can be expressed as the sum of two prime numbers. (Example: $4 = 2+2$.) Verify Goldbach's conjecture for 16 and 36.

2. Prime numbers that differ by 2 (like 5 and 7) are called **twin primes**. List two pairs of twin primes less than 50.

3. Using the rules of divisibility (rather than dividing the number explicitly), determine whether 660 is divisible by 2, 3, 4, 5, 9, 10, and 11.

- Express the number 144 as a product of prime factors in index notation.
- Find the Highest Common Factor (HCF) of 18, 24, and 36 using any method you want.
- Find the Least Common Multiple (LCM) of 18, 24, and 36 using any method you want.
- Using prime factorization, find the cube root of 512.