

Understand and Teaching Mathematics
Mathematics Homework Assignment #6
Due: Tuesday, April 17, 2007

1. What is the largest two-digit prime number?
2. Factor 273 into primes.
3. A student noticed that 209×527 and 341×323 are equal, and both equal 110,143.
Explain why this is not a violation of the Fundamental Theorem of Arithmetic.
4. Consider the following:

1	is odd
1 + 2	is odd
1 + 2 + 3	is even
1 + 2 + 3 + 4	is even
1 + 2 + 3 + 4 + 5	is odd
1 + 2 + 3 + 4 + 5 + 6	is odd
1 + 2 + 3 + 4 + 5 + 6 + 7	is even
1 + 2 + 3 + 4 + 5 + 6 + 7 + 8	is even
1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9	is odd

Notice that the first two sums are odd, the next two are even, the next two are odd, and so forth.

Is the pattern upheld when adding the numbers from 1 to 10?

Do these observation prove that the pattern continues forever?

5. Prove that when two even integers are multiplied together, the result is divisible by 4. [Hint: Use the proof that the sum of two even numbers is even as a template.]