

## Math 160A - Winter 2002 - Homework #5

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*Due Wednesday, February 27.*

From the textbook. Section 2.1, pages 79-80: Problems 7, 8, 10.

For the next problems, use the language of arithmetic, with symbols

$=, <, \mathbf{0}, \mathbf{S}, +, \cdot, \mathbf{E}$ .

Express each of the following statements as a formula (you may abbreviate the formula: it is not necessary to give the formal expression for the wff.)

- (a) “ $x$  divides  $y$ ”.
- (b) “ $x$  is greater than 1”.
- (c) “ $x$  is a prime”.
- (d) “Every prime factor of  $x$  is a prime factor of  $y$ ”.
- (e) “There are arbitrarily large primes”. (Hint: express by saying there is no number bigger than all primes.)

Now, for each of the five formulas that were your answers to problems (a)-(e), tell which variables occur free in the formulas.

Finally, rewrite your answers to (a) and (b) as a fully written out (non-abbreviated) well-formed formulas.