

Name: _____

MATH 110 – EXAM 1

10 September 2004

Dr. Szczepański. Version A.

Directions: Answer every question. Show all work and justify your answers. Each question is worth five points.

1. (a) Write the number 2100 as the product of prime numbers.

(b) Is 253 a prime number? How do you know?

2. Consider the number $(1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 \times 9 \times 10 \times 11 \times 12 \times 13 \times 14 \times 15 \times 16 \times 17 \times 18 \times 19 \times 20 \times 21 \times 22 \times 23 \times 24 \times 25 \times 26 \times 27 \times 28 \times 29 \times 30 \times 32 \times 33 \times 34 \times 35 \times 36 \times 37 \times 38 \times 39 \times 40 \times 41 \times 42 \times 43 \times 44 \times 45 \times 46 \times 47 \times 48 \times 49 \times 50) + 1$.

(a) Is it evenly divisible by 3? How do you know?

(b) What conclusions can you draw about this number's prime factors?

9. You are at the river with a three quart bucket and a five quart bucket. Neither has any markings or lines on them that could be used for measurement. How would you bring back exactly four quarts of water?

10. List five strategies that may be used in problem solving while devising or carrying out the plan.

[Bonus: 3 points] List some values of n for which 2^{n-1} is a prime number and some values of n for which it is not a prime number.