

## Problem



I am a two-digit number. Each of my digits is a prime number. When I subtract my ones digit from my tens digit the result is greater than the value of my ones digit. What number(s) could I be?

***Extension :***

If I am a three-digit number with the same properties as above, what numbers could I be?

**Hints**

**Hint 1** - Which of the digits 0, 1, 2, ..., 9 are prime numbers?

**Hint 2** - Could my ones digit be 5?

*Extension:*

**Hint 1** - What are the possible choices for the last two digits?

**Solution**

The only prime digits are 2, 3, 5, and 7. Since subtracting my ones digit from my tens digit gives a difference greater than my ones digit, my ones digit can only be 2, or 3, and my tens digit might be 5 or 7. 53 doesn't work, since  $5 - 3 = 2$ , which is not greater than 3. Thus I must be 52, 72, or 73.

*Extension:*

If I am a three-digit number with the same properties, then my last two digits can only be 52, 72, or 73. But my first digit can be any of 2, 3, 5, or 7, so I could be any of 252, 272, 273, 352, 372, 373, 552, 572, 573, 752, 772, or 773.