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Solution to Problem 1017.

The sum of all the elements above the n 'th row is $M_n = \sum_{i=0}^{n-1} 2^i = 2^0 + 2^1 + 2^2 + \dots + 2^{n-1} = 2^n - 1$. The number M_n is called the n 'th Mersenne number. A Mersenne prime is when M_n is prime. We know if $M_n = 2^n - 1$ is prime then n must be prime. In Pascal's triangle, there are n elements in the $(n - 1)$ 'th row. And of course, n is prime.

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