



## Problem of the Week

### Problem D

#### It Can't be Done

A *prime* number is a positive integer greater than 1 that has exactly two positive integer factors, 1 and the number itself. A *composite* number is a positive integer greater than 1 that has more than two positive integer factors. The number 1 is neither prime nor composite.

*Goldbach's conjecture* states that every even integer greater than 2 can be expressed as the sum of two primes. This conjecture is one of the oldest unsolved number theory problems in mathematics. The conjecture has been shown to be true for all even integers up to  $4 \times 10^{18}$ . You could verify this conjecture for all even two-digit positive integers but we won't ask you to do it today. However, Goldbach's conjecture will be useful in solving our problem.

Some two-digit positive integers cannot be expressed as the sum of two primes. It just can't be done. How many of these two-digit positive integers are there?



10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

