

# PRIMES, SEMI-PRIMES, AND STRONG COMPOSITES

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As is well known, all integers greater than 1 are either prime or composite. In particular, a composite number of two or more digits will be called a semi-prime if it can be transformed into a prime simply by changing its first digit. A leading digit of 0 (zero) will be considered unacceptable in the transforming process. Hence, the composite number 27 is a semi-prime as the changing of its first digit from 2 to 1 results in the prime number 17. The finding of examples of semi-primes is a fairly simple task. However, deciding the cardinality of such a set is another matter. Before answering the cardinality question, several explorations among the integers should be pursued. We will begin by noting that a prime number to which a semi-prime is transformed is called a metamorphic prime. For example:

	A Corresponding	
Semi-Prime	Metamorphic Prime	Not a Semi-Prime
33	23	37
157	257	56
9999	1999	125
75537	65537	21478015854767451
116091	216091	53798277528181133

An example of a number which is not a semi-prime is 56 (as shown in the table above). No even number or a number with a last digit of 5 can be a semi-prime as factorization is always guaranteed regardless of the first digit choice. Actually, all primes of two or more digits are metamorphic. That is, it is always possible by an