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We will consider the following question: what are the interesting properties of infinite sets of primes, and what determines whether an infinite set of primes has a particular property. We will start with an obvious fact that each set of primes is Turing equivalent to a set of positive integers, and therefore sets of primes inherit the Turing degree structure of  $\mathbb{N}$ . We will next note that each set of primes also corresponds to a subring of  $\mathbb{Q}$  and is also Turing equivalent to the set of elements of the ring. Now these rings possess different arithmetic and logic properties that we can now attach to the sets of primes. Some of the questions we will discuss is whether two sets of primes differing by a finite number of elements, always have the same properties, and whether some logic properties of the sets of primes are equivalent to some arithmetic properties of these sets. (Received September 11, 2019)