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We propose the exercise of finding infinite families of proofs that the primes are infinite. We give several examples. One example is this. Assume that the number of primes is finite. Let k be a positive integer. For the k th proof note that the Riemann zeta function evaluated at $2k$ is irrational. There is a well known product formula of Euler that shows that if the number of primes is finite, then the Riemann zeta function evaluated at $2k$ must be rational. This contradiction completes the k th proof. (Received September 15, 2010)