

## STEP III, 2013, Q5 EC

5. Nearly as many attempted this as question 4, but only achieving a quarter of the marks making it the least successfully answered question. Almost all missed the point of the question given in the first sentence, and made other assumptions, which frequently only applied to primes rather than integers in general. As a consequence, most did not satisfactorily justify their results.

They generally fared better tackling the second part of (i), though some tried to prove the statement in the wrong direction. They approached (ii) better though few gave a valid argument why  $p^n \leq n$ .