

UW Math Circle
January 31, 2013

1. Show that the product of any five consecutive integers is divisible by 120.
2. Find a number m for which $15 \cdot m \equiv 1 \pmod{83}$.
3. Brave Sir Cosmo's Chicken Shack sells chicken nuggets in packs of four and seven. Can you go to BSCCS and buy exactly 12 nuggets? how about 13 nuggets? For which numbers N is it possible to buy exactly N nuggets from Brave Sir Cosmo? For which numbers N is it impossible to buy N nuggets?
4. Find prime numbers p , q , and r for which $pq = 1591$ and $pr = 1739$. [Hint: Do this without trying to factor 1591 or 1739]