IF AN INTEGER N IS DIVISIBLE BY A PRIME P, THEN $N+1$ IS NOT DIVISIBLE BY P.

PROOF: SUPPOSE N IS DIVISIBLE BY P. THEN THERE IS AN INTEGER Q SUCH THAT $N = PQ$. SO $N+1 = PQ+1$. THEN

$$\frac{N+1}{P} = q + \frac{1}{P}.$$

BUT $q + \frac{1}{P}$ IS NOT AN INTEGER. SO $N+1$ IS NOT DIVISIBLE BY P.