

Collected Problems:

1. Prove that if  $a, b$  are integers with  $a \neq b$  then  $(a - b)|(a^n - b^n)$ .
2. Suppose that  $f$  and  $g$  are arithmetic functions (but not necessarily multiplicative). Show that if  $f(1) = g(1)$  and for all  $n$ ,  $\sum_{d|n} f(d) = \sum_{d|n} g(d)$  then  $f(n) = g(n)$  for all  $n$ .