

PROBLEM I Assume p is an odd prime, $a > 1$ is integral. Prove:

1. The odd prime factor of $a^p - 1$ is $a - 1$ or $2px + 1$, where x is integral.
2. The odd prime factor of $a^p + 1$ is $a + 1$ or $2px + 1$, where x is integral.

PROBLEM II Find at least one primitive root for each number 7, 49, 343, 686.