Note:

- **Organize your answers in the same order as the problems.**
- **Write legibly.**

1- Prove that $\sum_{k=1}^{n} k^2 = \frac{n(n+1)(2n+1}{6}$, $n \geq 1$.

2- Find $d = (105, 350, 140)$, then express d as a linear combination of the numbers.

3- Show that $(a,b)[a,b] = ab$ for all positive a, b .

4- Find all solutions of the Diophantine equation $9x - 18y + 48z = 3$.

5- Find all primes p such that $p^2 + 3$ is prime with justification (مع التبرير).