Show **ALL** work for credit; be neat; and use only **ONE** side of each page of paper.

1. Expand $(2u - v)^7$

2. Prove by induction $\frac{1}{1^2} + \frac{1}{2^2} + \cdots + \frac{1}{n^2} < 2 - \frac{1}{n}$ for all integers $n \geq 2$.