1080 d. Dokazati da za sve prirodne brojeve *n* važi:

$$1^2+2^2+3^2+\ \dots\dots\dots+n^2=\frac{n(n+1)(2n+1)}{6}$$

Prvo pokazujemo da važi za:

$$za\ n=1\ ,\qquad 1^2=\frac{1\cdot(1+1)(2+1)}{6}$$

$$za\ n=2\ ,\qquad 1^2+2^2=\frac{2\cdot(2+1)(4+1)}{6}$$

$$za\ n=3\ ,\qquad 1^2+2^2+3^2=\frac{3\cdot(3+1)(6+1)}{6}$$

Pretpostavimo da važi i $za\ n=k$, INDUKCIJSKA HIPOTEZA (IH)

$$1^2+2^2+3^2+\ \dots\dots\dots+k^2=\frac{\boldsymbol{k\cdot(k+1)(2k+1)}}{\boldsymbol{6}}$$

Tada je $za\ n=k+1$, INDUKCIJSKI KORAK (IK)

$$1^2+2^2+3^2+\ \dots\dots\dots+k^2+(k+1)^2=\frac{(k+1)\cdot[(k+1)+1]\cdot[2(k+1)+1]}{6}$$

$$1^2+2^2+3^2+\ \dots\dots\dots+k^2+(k+1)^2=\frac{(k+1)(k+2)(2k+3)}{6}$$

‘ Pozivamo’ indukcijsku hipotezu:

$$\frac{\boldsymbol{k\cdot(k+1)(2k+1)}}{\boldsymbol{6}}+(k+1)^2=\frac{(k+1)(k+2)(2k+3)}{6}$$

$$\frac{k\cdot(k+1)(2k+1)}{6}+\frac{6\cdot(k+1)^2}{6}=\frac{(k+1)(k+2)(2k+3)}{6}$$

$$\frac{k\cdot(k+1)(2k+1)+6\cdot(k+1)^2}{6}=\frac{(k+1)(k+2)(2k+3)}{6}$$

$$\frac{(k+1)[(2k^2+k)+6(k+1)]}{6}=\frac{(k+1)(k+2)(2k+3)}{6}$$

$$\frac{(k+1)[2k^2+k+6k+6]}{6}=\frac{(k+1)(k+2)(2k+3)}{6}$$

$$\frac{(k+1)(2k^2+7k+6)}{6}=\frac{(k+1)(k+2)(2k+3)}{6}$$

$$\frac{(k+1)(2k^2+4k+3k+6)}{6}=\frac{(k+1)(k+2)(2k+3)}{6}$$

$$\frac{(k+1)[2k(k+2)+3(k+2)]}{6}=\frac{(k+1)(k+2)(2k+3)}{6}$$

$$\frac{(k+1)(k+2)(2k+3)}{6}=\frac{(k+1)(k+2)(2k+3)}{6}$$