

2.83
2.1

$n=1$

$$3^2 - 4^2 + 6^2 - 7^2 = -9 - 10 - 1$$
$$9 - 16 + 36 - 49 = -20 \quad \checkmark$$

$n=k$

$$(3k^2) - (3k+1)^2 + (3k+3)^2 - (3k+4)^2 + \dots + (6n^2) - (6n+1)^2 = -9n^2 - 10n$$

$n=k+1$

$$(3k+3)^2 - (3k+4)^2 + \dots + (6k^2 - (6k+1)^2) + (6k+3)^2 - (6k+4)^2 + (6k+6)^2 - (6k+7)^2$$
$$= -9(k+1)^2 - 10(k+1) - 1$$

$$-9k^2 - 10k - 1 - (3k)^2 + (3k+1)^2 + (6k+3)^2 - (6k+4)^2 + (6k+6)^2 - (6k+7)^2 =$$

$$-9k^2 - 10k - 1 - 9k^2 + 9k^2 + 6k + 1 + 36k^2 + 36k + 9 - 36k^2 - 48k + 16 + 36k^2 + 72k + 36$$

$$-36k^2 - 84k + 49$$

$$-9k^2 - 28k - 20 = \leftarrow$$