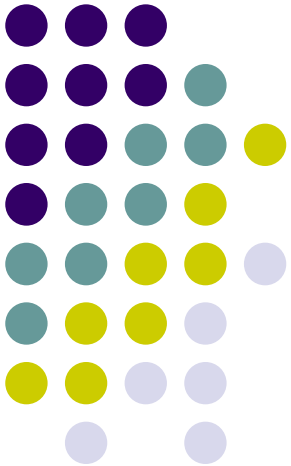
# Summation formula (3)

Sum of Squares and
Sum of Cubes



# Outline

- Sum of Squares
- Sum of Cubes

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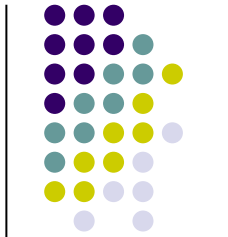
# Sum of Squares

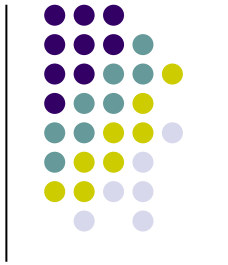


Using mathematical induction, we can prove the formula for sum of squares and sum of cubes.

**Theorem (Sum of Squares)**

$$\sum_{k=1}^{n} k^2 = \frac{n(n+1)(2n+1)}{6}$$

# Sum of Cubes



## Example

Find the sum $\sum_{i=1}^{n} \frac{1}{n}(\frac{i}{n})^2$.

## Theorem (Sum of Cubes)

$$\sum_{k=1}^{n} k^3 = (\frac{n(n+1)}{2})^2$$

# Review

- What is the sum of consecutive squares?
- What is the sum of consecutive cubes?

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