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

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$(k+1)^3$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1$ $\quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1$ $(k+1)^3 - k^3 = 3k^2 + 3k + 1$

2^3

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1$ $(k+1)^3 - k^3 = 3k^2 + 3k + 1$

2^3 $-$ 1^3

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$2^3 \quad - \quad 1^3 \quad = \quad 3 \times 1^2$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1$ $\quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$2^3 \quad - \quad 1^3 \quad = \quad 3 \times 1^2 \quad + \quad 3 \times 1$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1$ $\quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$2^3 \quad - \quad 1^3 \quad = \quad 3 \times 1^2 \quad + \quad 3 \times 1 \quad + \quad 1$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{aligned} 2^3 \quad - \quad 1^3 \quad &= \quad 3 \times 1^2 \quad + \quad 3 \times 1 \quad + \quad 1 \\ 3^3 & \end{aligned}$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1$ $(k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$2^3 - 1^3 = 3 \times 1^2 + 3 \times 1 + 1$$

$$3^3 - 2^3$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1$ $\quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{lllllll} 2^3 & - & 1^3 & = & 3 \times 1^2 & + \; 3 \times 1 & + \; 1 \\ 3^3 & - & 2^3 & = & 3 \times 2^2 & & \end{array}$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{cccccccc} 2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\ 3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & & \end{array}$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1$ $\quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{ccccccccc} 2^3 & - & 1^3 & = & 3\times 1^2 & + & 3\times 1 & + & 1 \\ 3^3 & - & 2^3 & = & 3\times 2^2 & + & 3\times 2 & + & 1 \end{array}$$

$\sum_{k=1}^{n} k^2$

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$$\begin{array}{lclclclcl}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & &
\end{array}$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{llllll} 2^3 & - & 1^3 & = & 3\times 1^2 & + & 3\times 1 & + & 1 \\ 3^3 & - & 2^3 & = & 3\times 2^2 & + & 3\times 2 & + & 1 \\ & & \vdots & & & & & & \\ n^3 & - & & & & & & & \end{array}$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{llllllll}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & & & & & &
\end{array}$$

$\sum_{k=1}^{n} k^2$

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

$$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$$

$$\begin{array}{llllllll}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + \ 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + \ 1 \\
 & & \vdots & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & & &
\end{array}$$

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2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & &
\end{array}$$

$\sum_{k=1}^{n} k^2$

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 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1
\end{array}$$

$\sum_{k=1}^{n} k^2$

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2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & & & & & & & &
\end{array}$$

$\sum_{k=1}^{n} k^2$

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$$\begin{array}{llllllll}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & & & & & &
\end{array}$$

$\sum_{k=1}^{n} k^2$

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

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$$\begin{array}{lclclclcl}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & & & &
\end{array}$$

$\sum_{k=1}^{n} k^2$

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

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$$\begin{array}{llllllllll}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & &
\end{array}$$

$\sum_{k=1}^{n} k^2$

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$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{lcccccccc}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & + & 1
\end{array}$$

$\sum_{k=1}^{n} k^2$

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$$\begin{array}{lllllllll}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & + & 1
\end{array}$$

변변히 더하면

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{llllllllll}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & + & 1
\end{array}$$

변변히 더하면

$(n+1)^3$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{lclclclcl}
2^3 & - & 1^3 & = & 3\times 1^2 & + & 3\times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3\times 2^2 & + & 3\times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3\times (n-1)^2 & + & 3\times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3\times n^2 & + & 3\times n & + & 1
\end{array}$$

변변히 더하면

$$(n+1)^3 \quad - \quad 1^3$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{lllllllll}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & + & 1
\end{array}$$

변변히 더하면

$$(n+1)^3 \quad - \quad 1^3 \quad = \quad 3$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{lclclclcl}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & + & 1
\end{array}$$

변변히 더하면

$$(n+1)^3 \quad - \quad 1^3 \quad = \quad 3 \times \sum_{k=1}^{n} k^2$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{lcccccccc}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & + & 1
\end{array}$$

변변히 더하면

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

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{lcllcllcl}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & + & 1
\end{array}$$

변변히 더하면

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

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{llllllllll}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & + & 1
\end{array}$$

변변히 더하면

$$(n+1)^3 \quad - \quad 1^3 \quad = \quad 3 \times \sum_{k=1}^{n} k^2 \quad + \quad 3 \times \sum_{k=1}^{n} k \quad + \quad n$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{lclclclcl}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & + & 1
\end{array}$$

변변히 더하면

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

$$(n+1)^3$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1$ $\quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{lclclclcl}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & + & 1
\end{array}$$

변변히 더하면

$$(n+1)^3 \quad - \quad 1^3 \quad = \quad 3 \times \sum_{k=1}^{n} k^2 \quad + \quad 3 \times \sum_{k=1}^{n} k \quad + \quad n$$

$$(n+1)^3 \quad - \quad 1^3$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{lcccccccc}
2^3 & - & 1^3 & = & 3\times 1^2 & + & 3\times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3\times 2^2 & + & 3\times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3\times (n-1)^2 & + & 3\times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3\times n^2 & + & 3\times n & + & 1
\end{array}$$

변변히 더하면

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

$$(n+1)^3 - 1^3 = 3$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1$ $\quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{lclclclcl}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & + & 1
\end{array}$$

변변히 더하면

$$\begin{array}{lclclclcl}
(n+1)^3 & - & 1^3 & = & 3 \times \sum_{k=1}^{n} k^2 & + & 3 \times \sum_{k=1}^{n} k & + & n \\
(n+1)^3 & - & 1^3 & = & 3 \times \sum_{k=1}^{n} k^2 & & & &
\end{array}$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{llllllll}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & + & 1
\end{array}$$

변변히 더하면

$$\begin{array}{llllllll}
(n+1)^3 & - & 1^3 & = & 3 \times \sum_{k=1}^{n} k^2 & + & 3 \times \sum_{k=1}^{n} k & + & n \\
(n+1)^3 & - & 1^3 & = & 3 \times \sum_{k=1}^{n} k^2 & + & 3 & &
\end{array}$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{lcccccccc}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & + & 1
\end{array}$$

변변히 더하면

$$\begin{array}{lcccccccc}
(n+1)^3 & - & 1^3 & = & 3 \times \sum_{k=1}^{n} k^2 & + & 3 \times \sum_{k=1}^{n} k & + & n \\
(n+1)^3 & - & 1^3 & = & 3 \times \sum_{k=1}^{n} k^2 & + & 3 \times \frac{n(n+1)}{2} & &
\end{array}$$

$\sum_{k=1}^{n} k^2$

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

$(k+1)^3 = k^3 + 3k^2 + 3k + 1 \quad (k+1)^3 - k^3 = 3k^2 + 3k + 1$

$$\begin{array}{lclclclcl}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & + & 1
\end{array}$$

변변히 더하면

$$\begin{array}{lclclclcl}
(n+1)^3 & - & 1^3 & = & 3 \times \sum_{k=1}^{n} k^2 & + & 3 \times \sum_{k=1}^{n} k & + & n \\
(n+1)^3 & - & 1^3 & = & 3 \times \sum_{k=1}^{n} k^2 & + & 3 \times \frac{n(n+1)}{2} & + & n
\end{array}$$

$\sum_{k=1}^{n} k^2$

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$$\begin{array}{lclclclcl}
2^3 & - & 1^3 & = & 3 \times 1^2 & + & 3 \times 1 & + & 1 \\
3^3 & - & 2^3 & = & 3 \times 2^2 & + & 3 \times 2 & + & 1 \\
 & & \vdots & & & & & & \\
n^3 & - & (n-1)^3 & = & 3 \times (n-1)^2 & + & 3 \times (n-1) & + & 1 \\
(n+1)^3 & - & n^3 & = & 3 \times n^2 & + & 3 \times n & + & 1
\end{array}$$

변변히 더하면

$$\begin{array}{lclclclcl}
(n+1)^3 & - & 1^3 & = & 3 \times \sum_{k=1}^{n} k^2 & + & 3 \times \sum_{k=1}^{n} k & + & n \\
(n+1)^3 & - & 1^3 & = & 3 \times \sum_{k=1}^{n} k^2 & + & 3 \times \frac{n(n+1)}{2} & + & n
\end{array}$$

Github:
https://min7014.github.io/math20200718001.html

Click or paste URL into the URL search bar, and you can see a picture moving.