No

Date

1. $P(n) = 2+4+6+\ldots+2n = n(n+1)$

- $n = 1$

$P(1) = 2+4+6+\ldots+2n = 1(1+1)$

$2(1) = 1(2)$

$2 = 2$ ✓

- $P(n+1)$

$P(n) = 2+4+6+\ldots+2n = n(n+1)$

$P(n+1) = 2+4+6+\ldots+2n+2(n+1) = (n+1)((n+1)+1)$

$n(n+1)+2(n+1) = (n+1)((n+1)+1)$

$n^2+n+2(n+1) = n+1(n+2)$

$n^2+3n+2 = n^2+3n+2$ ✓

Date

2. $P(n) : 1 + 4 + 9 + \ldots + n^2 = \frac{1}{6} n(n+1)(2n+1)$

- $n = 1$

$P(1) : 1 + 4 + 9 + \ldots + n^2 = \frac{1}{6} 1(1+1)(2(1)+1)$

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

$1 = 1$ ✓

- $P(n+1)$

$P(n) = 1 + 4 + 9 + \ldots + n^2 = \frac{1}{6} n(n+1)(2n+1)$

$P(n+1) = 1 + 4 + 9 + \ldots + n^2 + (n+1)^2 = \frac{1}{6} (n+1)((n+1)+1)(2(n+1)+1)$

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

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

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

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

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

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

3. $P(n) = 2 + 6 + 12 + \ldots + n(n+1) = \frac{1}{3} n(n+1)(n+2)$

- $n = 1$

$P(1) : 2 + 6 + 12 + \ldots + n(n+1) = \frac{1}{3} 1(1+1)(1+2)$

$2 = \frac{1}{3} 1(2)(3)$

$2 = 2$ ✓

- $P(n+1)$

$P(n) = 2 + 6 + 12 + \ldots + n(n+1) = \frac{1}{3} n(n+1)(n+2)$

$P(n+1) = 2 + 6 + 12 + \ldots + n(n+1) + (n+1)(n+2) = \frac{1}{3}(n+1)(n+2)(n+3)$

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

$n(n+1)(n+2) + 3(n+1)(n+2) = (n+1)(n+2)(n+3)$

$(n^2 + n)(n+2) + (3n+3)(n+2) = (n^2 + 3n + 2)(n+3)$

$(n^3 + 2n^2 + 2n + n^2) + (3n^2 + 6n + 3n + 6) = n^3 + 6n^2 + 11n + 6$

$n^3 + 6n^2 + 11n + 6 = n^3 + 6n^2 + 11n + 6$ ✓