$\boxed{1.2.1 \quad d)}$

$$\cancel{(-1)^{n+1}}\,\frac{n\,\cancel{(n+1)}}{2} + \underbrace{\cancel{(-1)^{n+1}}\,(-1)}_{(-1)^{n+2}} \cdot \underbrace{(n+1)\,\cancel{(n+1)}}_{(n+1)^2} =$$

$$\cancel{(-1)^{n+1}(n+1)}\left[\frac{n}{2} + (-1)(n+1)\right] =$$

$$(-1)^{n+1}(n+1)\left(\frac{n}{2} - \frac{1}{1}n - 1\right) = (-1)^{n+1}(n+1)\left(-\frac{n}{2} - 1\right)$$

$$= (-1)^{n+1}(n+1)\cdot(-1)\left(\frac{n}{2}+1\right)$$

$$\frac{n}{2} - \frac{2n}{2} - 1$$

$$= (-1)^{n+2}(n+1)\cdot\frac{n+2}{2} = (-1)^{n+2}\cdot\frac{(n+1)(n+2)}{2}$$

$$\frac{n-2n}{2} - 1$$

$$= (-1)^{((n+1)+1)}\cdot\frac{(n+1)((n+1)+1)}{2}$$

$$= P(n+1)$$