Sums of the type

$$\sum_{i=0}^{\infty} \frac{(-1)^k}{(2i+1)^3}.$$

For k = 0 [A233091] :

$$\frac{7}{8}\zeta(3) = 1 + \frac{1}{3^3} + \frac{1}{5^3} + \frac{1}{7^3} + \frac{1}{9^3} + \frac{1}{11^3} + \frac{1}{13^3} + \frac{1}{15^3} + \frac{1}{17^3} + \cdots$$

For k = i , $(-1)^k$ = 1, -1, 1, -1, 1, -1, ... [A153071] :

$$\frac{\pi^3}{32} = 1 - \frac{1}{3^3} + \frac{1}{5^3} - \frac{1}{7^3} + \frac{1}{9^3} - \frac{1}{11^3} + \frac{1}{13^3} - \frac{1}{15^3} + \frac{1}{17^3} - \cdots$$

For k = floor(i:2) , $(-1)^k$ = 1, 1, -1, -1, 1, 1, ... [A251809] :

$$\frac{3}{128}\sqrt{2}\,\pi^3 = 1 + \frac{1}{3^3} - \frac{1}{5^3} - \frac{1}{7^3} + \frac{1}{9^3} + \frac{1}{11^3} - \frac{1}{13^3} - \frac{1}{15^3} + \frac{1}{17^3} + \cdots$$

For k = floor(i:3) , $(-1)^k$ = 1, 1, 1, -1, -1, -1, 1, 1, 1, ... [A251967] :

$$\frac{29}{864}\pi^3 = 1 + \frac{1}{3^3} + \frac{1}{5^3} - \frac{1}{7^3} - \frac{1}{9^3} - \frac{1}{11^3} + \frac{1}{13^3} + \frac{1}{15^3} + \frac{1}{17^3} - \cdots$$

For k = floor(i:4) , $(-1)^k$ = 1, 1, 1, 1, -1, -1, -1, -1, 1, 1, 1, 1, -1, -1, -1, -1, ... :

$$\frac{1}{512}\sqrt{274+17\sqrt{2}}\,\pi^3 = 1 + \frac{1}{3^3} + \frac{1}{5^3} + \frac{1}{7^3} - \frac{1}{9^3} - \frac{1}{11^3} - \frac{1}{13^3} - \frac{1}{15^3} + \frac{1}{17^3} + \cdots$$

For k = floor(i:5) , $(-1)^k$ = 1, 1, 1, 1, 1, -1, -1, -1, -1, -1, 1, 1, 1, 1, 1, ... :

$$\frac{(1+60\sqrt{5})\pi^3}{4000} = 1 + \frac{1}{3^3} + \frac{1}{5^3} + \frac{1}{7^3} + \frac{1}{9^3} - \frac{1}{11^3} - \frac{1}{13^3} - \frac{1}{15^3} - \frac{1}{17^3} - \frac{1}{19^3} + \cdots$$