HW # 6, Section 5.1 Solutions M325K SPRING 2024

Sec 5.1, #4.

$d_m = 1 + \left(\frac{1}{2}\right)^m$ for all integers $m \geq 0$.

The first four terms: $d_0 = 2$, $d_1 = 1\frac{1}{2}$, $d_2 = 1\frac{1}{4}$, $d_3 = 1\frac{1}{8}$.

#16. $\sum_{m=0}^{3} \frac{1}{2^m} =$

$\frac{1}{2^0} + \frac{1}{2^1} + \frac{1}{2^2} + \frac{1}{2^3} = 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8}$

$= \frac{8}{8} + \frac{4}{8} + \frac{2}{8} + \frac{1}{8} = \frac{15}{8}$.

#18 $\sum_{i=1}^{1} i(i+1) = 1(1+1) = 2$

#32: $\sum_{i=1}^{k+1} i(i!) = \left(\sum_{i=1}^{k} i(i!)\right) + (k+1)((k+1)!)$

#34: $\sum_{m=1}^{n+1} m(m+1) = \left(\sum_{m=1}^{n} m(m+1)\right) + (n+1)(n+2)$

#38: $1^2 - 2^2 + 3^2 - 4^2 + 5^2 - 6^2 + 7^2 = \sum_{i=1}^{7} (-1)^{i+1} i^2$

#45: $\frac{1}{2!} + \frac{2}{3!} + \frac{3}{4!} + \dots \frac{n}{(n+1)!} = \sum_{k=1}^{n} \frac{k}{(k+1)!}$