Assignment-1

EE:1205 ($SignalsSystems$)
Indian Institute of Technology, Hyderabad

Md Ayaan Ashraf
EE23BTECH11041

Question 10.5.3.12:

Find the sum of the first 40 positive integers divisible by 6.

Solution:

Parameter	Description	Value
x(0)	First Term	6
d	Common Difference	6

TABLE 0
Parameter Table

The first 40 positive integers that are divisible by 6 are 6,12,18,24...
x(0)=6 and d=6

$$x(n) = (x(0) + nd)\,u(n) \tag{1}$$

$$x(n) = ((6 + 6n))\,u(n) \tag{2}$$

$$S_n = \frac{n}{2}\left(2x(0) + (n-1)\,d\right) \tag{3}$$

$$S_{40} = \frac{40}{2}\left(2(6) + (40-1) * 6\right) \tag{4}$$

$$= 20\,(12 + 234) \tag{5}$$

$$= 4920 \tag{6}$$

$$X(z) = \frac{x(0)}{(1 - z^{-1})} + \frac{dz^{-1}}{(1 - z^{-1})^2} \tag{7}$$

$$= \frac{6}{1 - z^{-1}} + \frac{6z^{-1}}{(1 - z^{-1})^{-2}} \tag{8}$$