Summation

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Summation

$$\sum_{i=1}^{3}(10i - 8)$$

- $$= (10 \cdot 1 - 8) + (10 \cdot 2 - 8) + (10 \cdot 3 - 8) = 36$$

Another Quick Example

$$\sum_{n=5}^{7} 2^n = 2^5 + 2^6 + 2^7 = 32 + 64 + 128 = 224$$

An Infinite Sum

$$\sum_{t=1}^{\infty}\left(\frac{1}{2}\right)^t = \left(\frac{1}{2}\right)^1 + \left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^3 + \left(\frac{1}{2}\right)^4 + \left(\frac{1}{2}\right)^5 + \ \dots$$

$$= \left(\frac{1}{2}\right) + \left(\frac{1}{4}\right) + \left(\frac{1}{8}\right) + \left(\frac{1}{16}\right) + \left(\frac{1}{32}\right) + \ \dots$$

Conclusion

$$= \left(\frac{1}{2}\right) + \left(\frac{1}{4}\right) + \left(\frac{1}{8}\right) + \left(\frac{1}{16}\right) + \left(\frac{1}{32}\right) + \ \ldots$$

Close to 1

$$\sum_{t=1}^{\infty} \left(\frac{1}{2}\right)^{t} = 1$$

General Formula

Deriving this formula is beyond our course…

$$\sum_{t=1}^{\infty} X^t = \frac{X}{1-X} \qquad 0 < X < 1$$

$\frac{1}{2}$

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

$\frac{1}{2} \times \frac{2}{1} = 1$

Takeaways

We learned/remembered some common mathematical notation

We practiced with a few short examples

We demonstrated how an infinite number of terms can sum to a finite value