

Arithmetic and Geometric Sequences

$$a_n = a + (n-1)d$$

Arithmetic Sequence Have Common Difference d

$$a_n = ar^{n-1}$$

Geometric Sequence Have Common Ratio r

Identifying Sequences

1. Is the sequence arithmetic or geometric

↓
If there is
a common
difference.
Subtracting
subsequent
terms

↓
If there is a
common
ratio?
Dividing
subsequent
terms.

2. Apply the formulas.

11, 15, 19, 23

$$15 - 11 = 4$$

$$19 - 15 = 4$$

$$23 - 19 = 4$$

There is a common difference
of 4 which is an arithmetic
sequence.

$$\boxed{d = 4}$$

$$a_n = a + (n-1)d$$

I need to find the 30th
term.

$$\boxed{n = 30}$$

$$\boxed{a = 11} \text{ start value}$$

$$a_n = a + (n-1)d \rightarrow a_n = 11 + (30-1)4$$

$$\downarrow$$
$$a_n = 11 + (29)4$$

$$\downarrow$$
$$a_n = 127$$

$$\boxed{a_n = 127} \text{ 30th Term}$$

1	2	3	4	5	6	7	8	9	10
11,	15,	19,	23	27	31	35	39	43	47

11	12	13	14	15	16	17	18	19	20
51	53	59	63	67	71	75	79	83	87

21	22	23	24	25	26	27	28	29	30
91	95	99	103	107	111	115	119	123	127

$$\sum_{k=1}^4 \left(\frac{5}{2}\right)^k$$

4 ← End

1 ← Start value

$$\left(\frac{5}{2}\right)^1 + \left(\frac{5}{2}\right)^2 + \left(\frac{5}{2}\right)^3 + \left(\frac{5}{2}\right)^4$$

$$2.5 + 6.25 + 15.625 + 39.0625$$

$$\approx 63.4375$$

Common Ratio

$$r = 2.5$$

which is a
geometric
series

$$a_n = ar^{n-1}, n \geq 1$$