Geometric Sequences

EXP

Geometric Sequence: the ratio of any term to the previous term is constant (multiplied by same number each term)

(Exponential Growth or Decay)

common ratio: the constant ratio (r)

nth term of a geometric sequence: $a_n = a_1 r^{n-1}$ $\boxed{a_n = a_1 \cdot r^{n-1}}$

EX: 128, 64, 32, 16, 8..... find the 7th term

$r = \frac{1}{2}$ $a_1 = 128$

$a_7 = 128 * (\frac{1}{2})^6$

$a_7 = 128(1/64) = 2$

to find r: $\frac{a_2}{a_1}$ $\frac{(2nd\ term)}{(1st\ term)}$

Recursive Rules

recursive rule - gives the beginning term(s) of a sequence

recursive equation - tells how a_n relates to the previous terms

linear

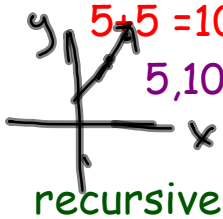
nth term = sum of previous term + common difference

recursive equation for arithmetic sequences: $a_n = a_{n-1} + d$

EX: $a_1 = 5$, $a_n = a_{n-1} + 5$, give the first six terms of the sequence

5+5 =10, 10+5=15, 15+5 =20, 20+5=25, 25+5=30

5,10,15,20,25,30



nth term = product of previous term * common ratio

exponential

recursive equation for geometric sequences: $a_n = r*a^{n-1}$

EX: $a_1 = 1$, $a_n = 2*a^{n-1}$, give the first six terms of the sequence

$2*1=2$, $2*2=4$, $2*4=8$, $2*8=16$, $2*16=32$

1,2,4,8,16,32