common ratio

- the ratio of successive terms in a geometric sequence,
  $r = \frac{t_n}{t_{n-1}}$
- the ratio may be positive or negative

$$t_1 = t_1$$
$$t_2 = t_1 r$$
$$t_3 = t_1 r^2$$
$$t_4 = t_1 r^3$$
$$\vdots$$
$$t_n = t_1 r^{n-1}$$

The *general term* of a geometric sequence where n is a positive integer is

$$\boldsymbol{t_n = t_1 r^{n-1}}$$

where t_1 is the first term of the sequence
n is the number of terms
r is the common ratio
t_n is the general term or nth term

when two random terms t_m and t_n are given:

"r" = via the division $\boxed{\frac{t_m}{t_n} = r^{m-n}}$ m, n random positions

The *sum* of a geometric series is can be determined using the formula

$$\boldsymbol{S_n = \frac{t_1(r^n - 1)}{r - 1}, r \neq 1}$$

where t_1 is the first term of the series
n is the number of terms
r is the common ratio
S_n is the sum of the first n terms

also equals $S_n = \frac{rt_n - t_1}{r - 1}$

advantage here: no power.
not necessary to know n