

Oct. 5

## Geometric Sequence and Series Word Problems

When solving geometric sequence and series word problems you need to follow these steps.

1. Read the problem and write out the terms of the sequence if possible.
2. Determine if the problem is a **sequence or series problem**
3. Determine the formula you will use to solve the problem
4. Construct the formula using the given information in the problem
5. Solve the question and check your answer back in the original problem to ensure that it makes sense.

**Example 1:**

Population projections are an important aspect of governmental planning. In 1990 the population of Canada was 26.6 million. The population in 2025 is projected to be 38.4 million. If this projection were based on a geometric **sequence**, what would the annual growth rate be??

$$26.6 \dots - - - \dots 38.4$$

$$t_n = a(r)^{n-1}$$

$$38.4 = 26.6(r)^{36-1}$$

$$\frac{38.4}{26.6} = r^{35}$$

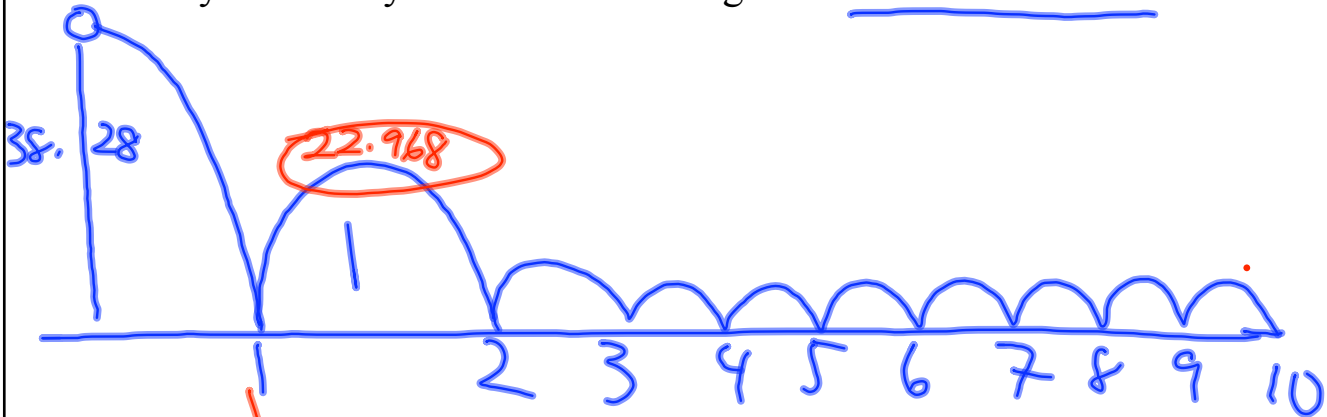
$$\sqrt[35]{\frac{38.4}{26.6}} = \sqrt[35]{r^{35}}$$

$$r = 1.0105$$

$$\begin{array}{r} 2025 \\ - 1990 \\ \hline 35 \\ + 1 \\ \hline 36 \end{array}$$

**Example 2:**

The tallest totem pole carved from a single log is 38.28m high and is in Beacon Hill Park in Victoria B.C. If a lacrosse ball is dropped from this height and bounces back up 60% of the original height, find the total distance travelled by the ball by the time it hits the ground for the tenth time



$$S_n = a(r^n - 1)$$

$$S_9 = \frac{22.968(r - 1)(0.6^9 - 1)}{0.6 - 1}$$

$$S_9 = (56.84 \times 2) + 38.28$$

$$S_9 = \underline{\underline{151.96 \text{ m}}}$$

**Example 3:**

Recent estimates, based on data from satellite observations, report 775 million hectares of rain forest remaining. The average annual rate of deforestation in the world is 0.77%. How many million hectares of rain forest will be lost in the next decade?

775,000,000

Start

①

$$t_n = a(r)^{n-1}$$

$$t_{11} = 775,000,000 (0.9923)^{11-1}$$

$$t_{11} = 717.35 \text{ remaining million}$$

$$775 - 717.35$$

$$\underline{57.65 \text{ million}}$$

~~End~~

②

