

## DO NOW

aka \_\_\_\_\_

Find the missing term or terms in each **geometric** sequence.

15) ..., -3,  $\pm 18$ , -108, ...

16) ..., -2, \_\_\_\_, -18, ...

$$\frac{-3(r^2)}{-3} = \frac{-108}{-3}$$

$$r^2 = 36 \quad \text{divide both sides by } -3$$

$$r^2 = 36 \quad \text{take the square root of both sides}$$

$$r = \pm 6 \quad \text{don't forget } (-6)^2 = 36 \text{ and } (6)^2 = 36$$

$$\text{so... } -3(6) = -18$$

$$-3(-6) = 18$$

*Therefore, the Geometric Mean =  $\pm 18$* 

26) ..., 1, \_\_\_\_, \_\_\_\_, \_\_\_\_, 16, ...

28) ..., -1, \_\_\_\_, \_\_\_\_, -27, ...

Simplify the following. Leave solutions with positive exponents only.

1.  $3 \cdot 4^3$

5.  $\frac{6^5}{6^3}$

21.  $\frac{1}{x^{-5}}$

2.  $4x^3 \cdot 2x^3$

8.  $-(9x)^0$

22.  $\frac{1}{2^{-4}}$

## 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.

**Objective: Use explicit formulas to solve geometric Series Word Problems.**

**1) A piano keyboard has 88 equally spaced musical notes. The first, and lowest, note is assigned the letter A, and it has a frequency of 27.5 hertz (Hz). The 13th note is also assigned the letter A, and it has a frequency twice that of the preceding A note, as does each subsequent A notes.**

a) Write an explicit formula for the frequencies of all the A notes.

b) Find the frequency of the seventh A note in the sequence.

**2) An office building purchased for \$ 1,200, 000 is appreciating because of rising property values in the city. At the end of each year its value is 105% of its value at the end of the previous year.**

a) Write an explicit formula for the value of the building after  $n$  years.

b) Use explicit formula to find the value of the building 4 years after it is purchased.

**3) 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 it will bounce back up 60% of the original height.**

a) Write an explicit formula for the height of the ball after  $n$  bounces.

b) Use explicit formula to find the **total distance travelled** by the ball by the time it hits the ground for the tenth time.

**4) A side of an apartment building is shaped like a staircase. The windows are arranged in columns. The first column has 2 windows, the next has 4, then 8, then 16, and so on.**

a) Write an explicit formula for the amount of windows per  $n$  columns.

b) Use an explicit formula to find the **total amount of windows** if the side of the building has 15 columns.

**5) Chrissy wants to host a party. She invites 3 friends and tells them to invite 3 of their friends. The 3 friends do invite 3 others and ask them to invite 3 more people. This invitation process goes on for 5 generation of invitations.**

a) Including Chrissy, what will the **total number** of people at the party be?

**6) A virus goes through a computer infecting files. One file was infected initially and the total number of files infected doubles every minute.**

a) Write an explicit formula for the number of files infected at any given ( $n$ ) minute.

b) Use an explicit formula to find the **total files infected** after 20 minutes.

**HW: Finish all word problems from this worksheet.**