**EX. 1** Determine the sum of the first 10 terms of each geometric series 
$$\eta = 10$$

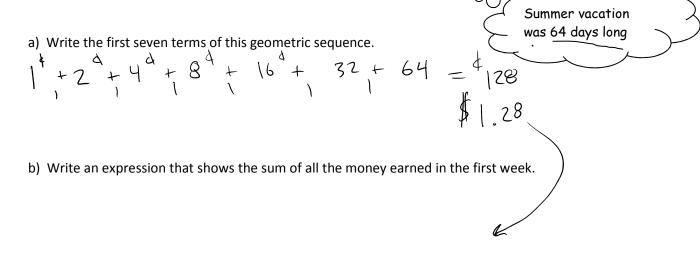
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a) 
$$4 + 12 + 36 + ...$$
  
S<sub>n</sub> =  $t_1 (r^n - 1)$   
S<sub>n</sub> =  $4 (\frac{r^{n-1}}{3^{n-1}})$   
S<sub>n</sub> =  $4 (\frac{r^{n-1}}{3^{n-1}})$   
S<sub>n</sub> =  $5 (\frac{r^{n-1}}{2^{n-1}})$   
S<sub>n</sub> =  $5 (\frac{r^{n-1}}{2^{n-1}})$   
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S<sub>n</sub> =  $\frac{r^{n-1}}{2^{n-1}}$ 

**EX. 2** Determine the sum of each geometric series.

$$\begin{array}{c} \mbox{Method 1: Determine Number of Terms} \\ a) \ \frac{1}{27} + \frac{1}{9} + \frac{1}{3} + ... + 729 \\ \ n = ? \\ \ Sn = \frac{r + n - + 1}{r - 1} \\ \ Sn = \frac{r + 1$$

**EX. 3** Your parents have come up with a reward system for the summer holidays if you keep your room clean! The deal is you are given a penny on the first day of summer vacation, two pennies on the second day, four pennies on the third day, eight pennies on the fourth day and so on... doubling for each succeeding day.



c) How much money do your parents give you on the 64<sup>th</sup> day?

$$\begin{array}{c} + & = + & r^{n-1} \\ + & & 64 - 1 \\ + & & 64 - 1 \\ + & & 64 - 1 \\ + & & 64 - 1 \\ + & & 64 - 1 \\ + & & 64 - 1 \\ + & & 64 - 1 \\ + & & 9 - & 2 \times 10^{16} \\ \end{array}$$

d) Determine how much money you would earn if you kept your room clean all summer.

$$S_{n} = \frac{f_{1}(r^{n} - 1)}{r^{-1}}$$

$$S_{n} = 0.01(2^{64} - 1))$$

$$2 - 1$$

$$S_{n} = 1.84 \times 10^{17}$$

$$1840 000 000 000 000 000 000$$

Worksheet: Geometric Series

1.	Find S <sub>7</sub> for each series: a) 5 - 10 + 20 - 40 +	b) 12 + 6 + 3 + 1.5 +	S <sub>7</sub> = 215
			S <sub>7</sub> = 23.8125
2. Find the sum of the given series: 1 + 5 + 25 + + 3125			S <sub>n</sub> = 3906

3. A doctor prescribes 200mg of medication on the first day of treatment. The dosage is halved on each successive day for 1 week. To the nearest milligram, what is the total amount of medication administered?

S<sub>n</sub>= 397 mg

4. Find  $S_n$  for a series with  $t_n = 5(2)^{n-1}$ . Careful!!!

S<sub>n</sub>= 5(2<sup>n</sup>-1)

**BONUS:** The second term of a geometric series is 15 and the sum of the first 3 terms is 93. Find the first 3 terms of the series. Show your work on the back.