

Geometric Series

1. Find the sum of the first 30 terms for the geometric series; $1 + 2 + 4 \dots$

2. Find S_{30} for the following geometric series; $-\frac{1}{8} - \frac{1}{4} - \frac{1}{2} \dots$

3. Find the sum of the geometric series $\frac{2}{3} + \frac{4}{15} + \frac{8}{75} \dots \frac{1024}{5859375}$

4. Determine an expression for S_n for a series with t_n equal to each value.

a) $t_n = 6(4)^{n-1}$

b) $t_n = 2(3)^{n-1}$

5. If the sum of the first 10 terms of a geometric series is 118 096 and the common ratio is 3. What is the value of the first term?

6. For a geometric series, $r = 2$ and $S_6 = -378$. What is the value of a ?

7. A checkers tournament has 128 entries. When a player loses a game, he or she is eliminated. Winners play in the next round. How many games are played before a winner is determined?

8. Jon's parents established a trust fund for him when he was born. They put 500 dollars a year into the fund beginning on his first birthday and every birthday after that up to and including his 21st birthday. To hedge against inflation, they increased the amount by 5% each year. How much in total did they contribute to the trust fund?

9. June wishes to plan for her retirement and decides to invest 1000 dollars a year into an RRSP starting at age 18 until age 30. After age 30, she no longer contributes any money but leaves in her RRSP until age 65. Jas on the other hand, contributes 1500 dollars a year from age 35 to age 65 in the same RRSP investment. Assuming that the interest rate was fixed at 8.5% compounded annually,

a) how much did each contribute to the RRSP?

b) how much would each have at age 65?

ANSWERS

1. 1073741823 2. -134217727.9 3. 1.11 4a. $S_n = -2(1 - 4^n)$ 4b. $S_n = 3^n - 1$ 5. $a = 4$ 6. $a = -6$

7. 127 8. 17859.63

9. June contributed 12 000 dollars and had 339,758.97 dollars at age 65
Jas contributed 45 000 dollars and had 186, 322.09 dollars at age 65