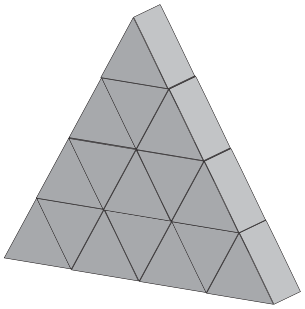
Series Problems Name:_____

Show all relevant work!

1. Consider the wall of bricks shown to the right.



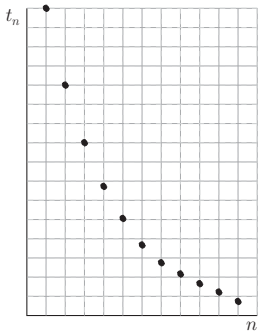
(a) Write a formula for the number of bricks in the n^{th} row.

(b) Find the total number of bricks needed to build this wall 75 rows high (don't just find the number for the 75^{th} row).

2. Find the term rule for the sequence: 5, 8, 18, 35, 59, ...

3. Find the formula for the n^{th} partial sum, S_n, of the series $5 + 8 + 18 + 35 + 59 + \cdots$

4. The graph of a geometric sequence is shown below.

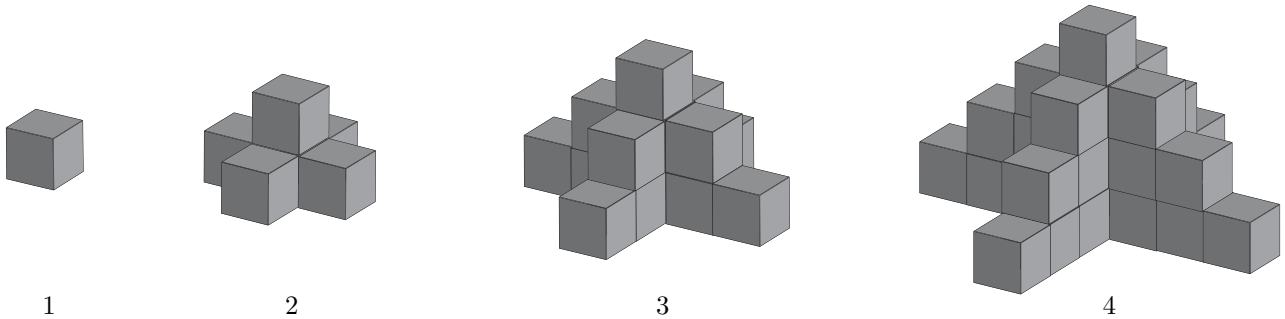


(a) Find the sequence rule for the the n^{th} term, t_n.

(b) Find the infinite sum of the terms in the sequence from part (a).

5. If a geometric sequence has $t_1 = 17$ and common ratio, $r = 1.4$, find n if $t_n \approx 1889$.

6. Find the total number of bricks needed to build the 50^{th} figure in this sequence.



1 2 3 4

7. Find these sums:

(a) S_{85} for $1 + 13 + 25 + 37 + \cdots$

(b) S_{42} for $3 + 4.5 + 6.75 + 10.125 + \cdots$

(c) $\displaystyle\sum_{k=1}^{200} 2k + 3$

8. Determine whether the series below Converge or Diverge. If they Converge determine the value they converge to. If they Diverge say so and explain why.

(a) $12 + 9.6 + 7.68 + 6.144 + \cdots$

(b) $2 + 2.2 + 2.42 + 2.662 + \cdots$

(c) $\displaystyle\sum_{k=1}^{\infty} 5 \cdot \left(\frac{2}{3}\right)^{k-1}$

(d) $4 - 3 + 2.25 - 1.6875 + \cdots$

(e) $\displaystyle\sum_{k=1}^{\infty} \left(20 \cdot (0.7)^k - 5\right)$

9. Write 1.851515151. . . as a fraction.

10. Evaluate $\displaystyle\sum_{k=1}^{\infty} k^2$

11. Find the infinite sum, $1 + 2\left(\frac{1}{3}\right) + 3\left(\frac{1}{3}\right)^2 + 4\left(\frac{1}{3}\right)^3 + 5\left(\frac{1}{3}\right)^4 + \cdots$