

Due before the second tutorial, monday October 8th.

The problems marked [**SELF**] are for your own practice and extra exercise; they will not be marked. No need to include them in your submission.

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1. Find the formula for the  $n$ -th term of each geometric sequence below.

(a) [**3 pts.**]  $2, 6, 18, 54, 162, \dots$

(b) [**5 pts.**]  $9, -3, 1, -\frac{1}{3}, \frac{1}{9}, -\frac{1}{27}, \dots$

(c) [**SELF**]  $-10, 5, -\frac{5}{2}, \frac{5}{4}, -\frac{5}{8}, \frac{5}{16}, \dots$

2. Find the sum of the finite arithmetic series below.

If you need to find the number of terms in the series, you could try first writing a formula for the  $n$ -th term of the sequence, and then figuring out which  $n$  the last term corresponds to.

(a) [**4 pts.**]

$$1 + 2 + 3 + 4 + \dots + 200$$

(b) [**5 pts.**]

$$-2 + 6 + 14 + 22 + \dots + 238$$

(c) [**SELF**]

$$4 + 7 + 10 + 13 + \dots + 100$$

(d) [**SELF**]

$$2 + 6 + 10 + 14 + \dots + 122$$

3. (a) [**6 pts.**] Find the sum of the first 100 terms of the series

$$(-8) + (-5) + (-2) + 1 + 4 + \dots$$

You may want to first find the last term of the finite series, i.e., the 100th term.

(b) [**6 pts.**] Find the sum of the first 200 terms of the series

$$-2 - 6 - 10 - 14 - \dots$$

4. Find the sum of the finite geometric series.

(a) [6 pts.]

$$2 + 1 + \frac{1}{2} + \frac{1}{4} + \cdots + \frac{1}{1024}$$

(b) [SELF]

$$5 + 5(0.9) + 5(0.9)^2 + 5(0.9)^3 + \cdots + 5(0.9)^{14}$$

(c) [SELF]

$$1 + 2 + 4 + 8 + \cdots + 2048$$

5. Find the sum of the infinite geometric series.

(a) [5 pts.]

$$5 + 5(0.9) + 5(0.9)^2 + 5(0.9)^3 + \cdots$$

(b) [5 pts.]

$$\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \cdots$$

(c) [5 pts.]

$$1 + 2 + 4 + 8 + \cdots$$

(d) [SELF]

$$3 + 1 + \frac{1}{3} + \frac{1}{9} + \cdots$$