* Mathematics 20-1
* Unit One
* Sequences and Series
* Unit Worksheet

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Solve for the following questions in the space provided. Marks will be given for work shown so be sure to show your work at all times.

**Section 1.1**

1. Determine if each sequence is arithmetic or not. If it is arithmetic, state the general formula.
2. -11, -4, 3, 10…
3. 2, -4, 8, -16…
4. If *t4*= 24 and *t10*=66, determine *t1* for the arithmetic sequence*.*
5. Consider the sequence 7, 14, 21, 28… Determine whether the number 378 is a term of this sequence. If the number is a term of the sequence, determine the value of *n* for that term.

**Section1.2**

1. Determine *S20*  for the following series -21 – 15.5 – 10 – 4.5 -…
2. If *Sn= -126*,  *t1*= -1and *tn*= -20; determine *n* for the arithmetic series.
3. Students created a trapezoid from the cans they had collected for the food bank. There were 10 rows in the trapezoid. The bottom row had 100 cans. Each consecutive row had 5 fewer cans than the previous row. How many cans were in the trapezoid?
4. The sum of the first 12 terms of an arithmetic series is 186 and the 20th term is 83. What is the sum of the first 40 terms?

**Section 1.3**

1. Find  of a geometric sequence with  and .
2. The bacteria in a petri dish double every three hours. There were 2000 bacteria at the initial count taken at noon. How many bacteria will there be at 3:00 am the next day?
3. The first three terms of a geometric sequence are and . If the common ratio is 6, then **determine** the value of *y.*

**Section 1.4**

1. Determine the sum of the following series



1. Find the sum of the first seven terms of the series

27 + 9 + 3 + …

1. A certain pile driver pounds a steel column into the ground. On the first drive, the column is pounded 1.8m into the ground, and on each successive drive it moves 92% as far as it did on its previous drive. Find the **total distance** that the column moves in 60 drives, correct to the nearest tenth of a metre.
2. How many terms of the series 2 + (-4) + 8 + (-16) + . . .will yield a sum of 342?

**Section 1.5**

1. Determine whether each infinite geometric series converges or diverges. If it converges, determine its sum.
2. 27 – 9 + 3 – 1 + …. b) 4 – 8 + 16 – 32 + …
3. If *t1* = 21, *S∞*= 63, determine *r*.
4. A pile driver pounds a metal post into the ground. With the first impact, the post moves 30 cm; with the second impact, it moves 27 cm. Predict the total distance the post will be driven into the ground if
5. the distances form an arithmetic sequence and the post is pounded eight times.
6. the distances form a geometric sequence and the post is pounded eight times.

c) the distances form a geometric sequence and the post is pounded until it has essentially stopped moving.