

1. Chairs in a theatre are arranged in such a way that the first two rows each has the same number of chairs. The third and fourth rows each have three more chairs than the first and second row. The fifth and sixth rows each have three more chairs than the third and fourth row, etc. The sequence of the number of chairs for every second row forms an arithmetic sequence. The first two rows each have 27 chairs, and the last two rows each have 114 chairs.
 - a) How many rows of chairs are there?
 - b) How many chairs are in the thirteenth row? The thirtieth row?
2. A truck sold for \$35000. The vehicle depreciates by \$5000 the first year, and \$2400 each year afterwards. Calculate the value of the vehicle at the end of the eleventh year.
3. Mrs. Mikula likes gardening. Because she is married to Mr. Mikula, she plants her flowers in rows that form an arithmetic sequence. In the eighth row of flowers in her garden, there are 58 flowers. In the fifteenth row, there are 107 flowers. How many total flowers are there in the first three rows?

4. Find the sum of each series below.

a) $2 + 3 + 4 + \dots$ (first 30 terms)

c) $2.5 + 2.7 + 2.9 + \dots$ to 16 terms

b) $(-8) + (-4) + 0 + \dots$ (first 27 terms)

d) $\frac{5}{2} + \frac{11}{6} + \frac{7}{6} + \frac{1}{2} + \dots$ to 12 terms

5. Consider the series defined by $S_n = 3n^2 - n$.

a) Find the first four terms of the series.

b) Determine the eighth term of the corresponding sequence.

6. Write a formula for the general term for each of the following sequences.

a) $4, 12, 36, 108, \dots$

c) $5, -10, 20, -40, \dots$

b) $3, 1.5, 0.75, 0.375, \dots$

d) $-3, \frac{3}{2}, -\frac{3}{4}, \frac{3}{8}, \dots$

7. Find the number of terms in each sequence.

a) $-6, -12, -24, \dots, -192$

b) $512, -256, 128, \dots, -1$

8. Place three geometric means between 24 and $\frac{3}{2}$.

9. The first three terms in a geometric sequence are $p, p + 5, p + 9$. Determine the *exact value* of each term.

10. State the growth factor in each of the following situations.

a) Canada's population is increasing by 1% per year.

b) My car is depreciating in value by 12% per year.

c) Mr. Mikula receives a salary increase of 2.4% per year.

d) Newspaper readership is declining by $7\frac{1}{2}\%$ per year.

e) A bouncing ball rebounds to $\frac{1}{3}$ of its previous height.

11. The value of a house is predicted to increase at an annual rate of 4% for the next five years. If the current market price is \$410000, determine (to the nearest dollar) the predicted price five years from now.

12. Joe invests \$2000 at 4.73% interest (compounded annually). To the nearest year, how many years would it take for his investment to double in value?

13. A line is divided into 5 parts whose lengths form a geometric sequence. If the shortest length is 2 cm, and the longest is 162 cm, find the length of the whole line.
14. In a geometric sequence, the third term is 1024 and the common ratio is 0.5. Determine the sum of the first nine terms of the sequence.
15. The general term of a geometric series is $t_n = 3(2)^{n-1}$, $n \geq 1$. The sum of the first seven terms of the corresponding series, to the nearest whole number, is:
16. The first term of a geometric series is 81 and the third term is 1. Determine the sum to infinity of each of the two possible series.
17. Use an infinite series to express the following repeating decimals as fractions.
- a) $0.\overline{5}$ b) $0.\overline{35}$ c) $0.3\overline{5}$