Arithmetic and Geometric Series – Worksheet

MCR3U

Jensen

General formula for an arithmetic series:

General formula for a geometric series:

1) Find the designated sum of the arithmetic series

a) S_{14} of $3 + 7 + 11 + 15 + \cdots$

b) S_{11} of $-13 - 11 - 9 - 7 - \cdots$

c) S_9 of $22 + 20 + 18 + 16 + \cdots$

d) S_{35} of $-2 - 5 - 8 - 11 - \cdots$

2) Determine the sum of each arithmetic series

a) $6 + 13 + 20 + \cdots + 69$

b) $4 + 15 + 26 + \cdots + 213$

c) $5 - 8 - 21 - \cdots - 190$

d) $100 + 90 + 80 + \cdots - 100$

3) Find the designated sum of the geometric series

a) S_7 of $4 + 8 + 16 + 32 + \cdots$

b) S_{13} of $1 - 6 + 36 - 216 + \cdots$

c) S_{17} of $486 + 162 + 54 + 18 + \cdots$

d) S_6 of $3 + 15 + 75 + 375 + \cdots$

4) Determine S_n for each geometric series

a) $a = 6, r = 2, n = 9$

b) $f(1) = 2, r = -2, n = 12$

c) $f(1) = 729, r = -3, n = 15$

d) $f(1) = 2700, r = 10, n = 8$

5) If the first term of an arithmetic series is 2, the last term is 20, and the increase constant is +2 …

a) Determine the number of terms in the series

b) Determine the sum of all the terms in the series

6) A geometric series has a sum of 1365. Each term increases by a factor of 4. If there are 6 terms, find the value of the first term.

Answers

1) a) 406 **b)** -33 **c)** 126 **d)** -1855

2) a) 375 **b)** 2170 **c)** -1480 **d)** 0

3) a) 508 **b)** 1 865 813 431 **c)** 729 **d)** 11 718

4) a) 3066 **b)** -2730 **c)** 2 615 088 483 **d)** $2.999\,999\,97 \times 10^{10}$

5) a) $n = 10$ **b)** $S_{10} = 110$

6) $t_1 = 1$