

REVIEW 2**Classwork**

Powers

$$a^m \cdot a^n = a^{m+n}, \quad (a^m)^n = a^{mn}, \quad \frac{1}{a^n} = a^{-n}, \quad (ab)^n = a^n \cdot b^n \quad (1)$$

Arithmetic progression $a_{n+1} = a_n + d$ with common difference d :

$$a_n = a_1 + d(n - 1) \quad (2)$$

and its sum

$$a_1 + a_2 + \dots + a_n = \frac{a_1 + a_n}{2} \cdot n \quad (3)$$

Geometric progression $b_{n+1} = b_n \cdot r$ with common ratio r

$$b_n = b_1 \cdot r^{n-1} \quad (4)$$

and its sum

$$b_1 + b_2 + b_3 + \dots + b_n = \frac{b_1(r^n - 1)}{r - 1} \quad (5)$$

If $-1 < r < 1$, then the infinite sum $b_1 + b_2 + \dots = \frac{b_1}{1-r}$.

1. Simplify the expressions

$$(a) \frac{(x^2yz^3)^2y^3z^2}{z^4y(xz)^3}; \quad (b) \frac{(a^2b)^3(b^2c)^4}{((ab)^2c)^3}; \quad (c) \frac{1000^3 \cdot 54^2}{18^3 \cdot 15^5}; \quad (d) \frac{35^2 \cdot 65^3}{50^3 \cdot 91^4};$$

2. What is the 12-th term of an arithmetic sequence a_n , if $a_3 = 8$ and $a_9 = 44$?

3. An arithmetic sequence of 100 numbers starts with $a_1 = 10$ and ends with $a_{100} = 200$. What is the sum of all the terms from a_1 to a_{100} ?

4. What are the first and the fifth terms of a geometric sequence $a_1, 24, 36, 54, a_5$?

5. In a geometric series of 15 terms, $a_1 = 5$ and $a_{15} = 320$, what is a_8 ?

6. Compute the sum $1 + \frac{1}{2} + \frac{1}{2^2} + \dots + \frac{1}{2^8}$.

7. Find the sum of the infinite series $\frac{1}{9} + \frac{1}{27} + \frac{1}{81} + \dots$

8. Plot the following functions

$$(a) x + 2y = 4; \quad (a) y = |x| - 2; \quad (b) y = 2|x + 1| - 3; \quad (c) |x| + 2|y| = 4.$$

9. Solve the equations:

$$(a) |3x + 4| = 8; \quad (b) |2x + 1| = 5; \quad (c) |4x - 5| = 3; \quad (d) |x - 1| + |2x + 1| = 4.$$

Homework

1. In an arithmetic sequence a_n with $a_1 = 4$ and $a_{25} = 40$,
(a) find terms a_{10} and a_{20} , (b) compute the sum of terms $a_{11} \dots a_{22}$.
2. In a geometric sequence b_n with $b_1 = 8$ and $b_{25} = 27$,
(a) what is the common ratio? (b) find terms b_9 and b_{17} .
3. Compute the infinite sum $1 + \frac{1}{5} + \frac{1}{25} + \frac{1}{125} + \dots$
4. Plot the following functions:
(a) $3x + 4y = 7$; (b) $y = |x - 1| + 1$; (c)* $|x - 2| + |y + 3| = 1$.
5. Solve the equations:
(a) $|2x - 3| = 11$; (b) $|7x + 5| = 1$; (c)* $||x| - 2| = 4$.