1 Math 6 Lesson 7 Classwork

Arithemtic and Geometric Sequences and Series

Arithmetic Sequence ans Series:

$$a_n = a_1 + (n-1)d, \qquad S_n = \frac{n}{2}(a_1 + a_n) = \frac{n}{2}(2a_1 + (n-1)d)$$

Geometric Sequence and Series:

$$b_n = b_1 q^{n-1}, \qquad S_n = b_1 \frac{q^n - 1}{q - 1}$$

1.
a) Find 3 first elements and the 24th element of the arithmetic progression with first term 3 and common difference 1.
b) Find 3 first elements and the 25th element of the arithmetic progression with first term -2 and common difference -3.
c) Find the 12th element of the arithmetic progression with first term -1/3 and common difference 3/5.

2.
a) Find the sum of the first five terms of the arithmetic progression with first term 2 and common difference 5.
b) Find the sum of the first four terms of the arithmetic progression with first term -2 and common difference 4.
c) Find the sum of the first three terms of the arithmetic progression with first term 1/2 and common difference -1/3.
d) Find the sum of the first four terms of the arithmetic progression with first term -5 and common difference 6.
3.
a) Find 3 first elements and the 22th element of the geometric progression with first term 2 and common ratio 3.
b) Find 3 first elements and the 24 th element of the geometric progression with first term -3 and common ratio -2.
c) Find 12 th element of the geometric progression with first term -1/3 and common ratio 1/4.

4.
a) Find the sum of the first five terms of the geometric progression with first term 1 and common ratio 3.
b) Find the sum of the first four terms of the geometric progression with first term -2 and common ratio 4.
c) Find the sum of the first three terms of the geometric progression with first term 1/2 and common ratio 1/8

5. Find the sum (the answer, of course, will depend on n)
$1 + 2 + 4 + ... + 2^n$

Review

6. Factor the following expressions:
a) $144a^2b^2 - 24abc + c^2$
b) $16x^2 - 64y^2z^4$

7. Solve
a) In how many ways can one select 3 students from the class of 18 students ?
b) In how many ways can one do the same selection but now order is important?
c) The same with repetition allowed?

8. What is the probability of pulling the red card or king out of the card deck of 52 cards.

9. Simplify
$$\frac{5^{-3}10^2 7^{-4}}{7^3 5^2 7^2}$$

2 Math 6 Lesson 7 Homework

Arithemtic and Geometric Sequences and Series

1.
a) Find the 3 first elements and the 27th element of the arithmetic progression with first term 2 and common difference 3.
b) Find the 3 first elements and the 32 th element of the arithmetic progression with first term -1 and common difference -2.
c) Find the 42 th element of the arithmetic progression with first term -1/2 and common difference 3/4.

2.
a) Find the sum of the first five terms of the arithmetic progression with first term 5 and common difference 4.
b) Find the sum of the first four terms of the arithmetic progression with first term -1 and common difference 3.
c) Find the sum of the first three terms of the arithmetic progression with first term 1/3 and common difference -1/4.
d) Find the sum of the first four terms of the arithmetic progression with first term -2 and common difference 3.
3.
a) Find the 3 first elements and the 27th element of the geometric progression with first term 3 and common ratio 2.
b) Find the 3 first elements and the 32 th element of the geometric progression with first term -1 and common ratio -2.
c) Find the 42 th element of the geometric progression with first term -1/2 and common ratio 1/2.

4.
a) Find the sum of the first five terms of the geometric progression with first term 2 and common ratio 4.
b) Find the sum of the first four terms of the geometric progression with first term -1 and common ratio 3.
c) Find the sum of the first three terms of the geometric progression with first term 1/3 and common ratio -1/4.

5. The following three terms are the 21st, 22nd, and 23rd terms of an arithmetic progression. Find the first term of this arithmetic progression: 87, 93, 99

Review

6. Factor the following expressions:
a) $100a^2b^2 + 20abc + c^2$
b) $9x^8 - 36y^2z^4$

7. Solve
a) In how many ways can one select 2 students from the class of 12 students ?

b) In how many ways can one do the same selection but now order is important?

c) The same with repetition allowed?

8. What is the probability of pulling the black card or queen out of the card deck of 52 cards.

9. Simplify

$$\frac{5^4 10^3 7^{-1}}{7^6 5^7 7^{-8}}$$