

# Ch. 11 Review

## Advanced Algebra

Name Key  
 Date Spring Per. ALL

Arithmetic  
 Sequence  
 $a_n = a_1 + d(n-1)$

1. Find the  $n^{\text{th}}$  term if,  $a_1 = -20$ ,  $d = 7$ , and  $n = 21$  120  
 $a_{21} = -20 + 7(20)$
2. Find  $a_{25}$  for  $-9, -6, -3, \dots$  63  
 $a_{25} = -9 + 24(3)$
3. Find the missing terms in the arithmetic sequence

40, 52, 64, 76, 88, 100.

$$40 + 5d = 100, 5d = 60 \quad d = 12$$

Arithmetic  
 Series  
 $S_n = \frac{n}{2}(a_1 + a_n)$

4. Find  $S_{11}$  for:  $a_1 = 21$ , and  $a_{11} = 2$  126.5  
 $S_{11} = \frac{11}{2}(21 + 2)$   $5 + 14(d) = 243$
5. Find the first three terms of:  $a_{15} = 243$  and  
 $S_{15} = 1860$ . 5, 22, 39  $S_{15} = 1860 = (a_1 + 243) \frac{15}{2}$

6. A Pile of fireplace logs at the Garden Shop has 15 logs on the top layer, 16 logs in the next layer, and so on. The pile contains 15 layers.

How many logs are in the pile?

330  $(15 + 29) \frac{15}{2}$

Geometric  
 Sequence  
 $a_n = a_1 r^{n-1}$

7. Find the next two terms of:  $\{54, 36, 24, \dots\}$  16,  $10\frac{2}{3}$   
 $\frac{2}{3}$   $\frac{2}{3}$
8. Find the  $n^{\text{th}}$  term for:  $a_1 = 3$ ,  $n = 7$  and  $r = 5$  46875  
 $a_7 = 3(5)^6$
9. Find the missing geometric means in:

2, -14, 98, -686, 4802.

$$-14r^3 = 4802 \quad r = -7$$

Geometric Series  

$$\sum_{n=1}^{\infty} \frac{a_1(1-r^n)}{1-r}$$

10. Find the sum of the geometric series with:

$a_1 = 9, a_6 = 9216$  and  $r = 4$

$(12,285)$

$S_6 = \frac{9(1-4^6)}{1-4}$

11. Find the sum of the geometric series with:

$a_1 = 150, r = 2$  and  $n = 7$ .

$(19,050)$

$\frac{150(1-2^7)}{1-2} = S_7$

12. Find  $a_1$  for:  $S_9 = 513, r = -2$ .

$513 = \frac{a_1(1-(-2)^9)}{1-(-2)}$

$(3)$

Infinite Geometric Series  

$$\sum_{n=1}^{\infty} \frac{a_1}{1-r} \quad -1 < r < 1$$

13. Find the sum of:  $16 + 8 + 4 + \dots$

$\frac{1}{2} \quad \frac{1}{2}$

$(32)$

$\frac{16}{1-1/2}$

14. Find the sum of:  $16 + 24 + 36 + \dots$

$\frac{3}{2}$

$(\infty)$

15. Find the sum of:  $25 - 15 + 9 - \dots$

$r = -3/5$

$(15 \frac{5}{8})$

$\frac{25}{1+3/5}$

16. Evaluate:  $\sum_{x=1}^8 3x^2 + 5$ .

$(652)$

$a_1 = 8 \quad a_4 = 53$   
 $a_2 = 17 \quad a_5 = 80$   
 $a_3 = 32 \quad a_6 = 113$   
 $a_7 = 152$   
 $a_8 = 197$

17. Evaluate:  $\sum_{n=1}^5 3(2^{n-1})$ .

$(93)$

$r = 2 \quad a_1 = 3 \quad S_5 = \frac{3(1-2^5)}{1-2}$

18. Find the 8<sup>th</sup> term in the series of:  $\sum_{n=1}^{20} -x + 21$ .

$(13)$

$-8 + 21 =$

19. If  $(x+y)^{12}$  is expanded, what is the exponent on 'x' in the term that contains  $y^7$ ?

$495x^5y^7 \cdot C_{12}^8 x^5y^7$

20. Expand  $(4s-2t)^5$ .

$1024s^5 - 2560s^4t + 2560s^3t^2 - 1280s^2t^3 + 320st^4 - 32t^5$

21. Expand  $(3+w)^7$ .

$2187 + 5103w + 5703w^2 + 2835w^3 + 945w^4 + 189w^5 + 21w^6 + w^7$

$$\begin{matrix} 1 & 6 & 15 & 20 & 15 & 6 & 1 \\ 1 & 7 & 21 & 35 & 35 & 21 & 7 & 1 \end{matrix}$$