

# Chapter 9 Syllabus

	<b>Date</b>	<b>Assignment</b>
1	4/17	9.1 Worksheet
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4	4/26	Chapter 9 Review & <b>EOC Skills #1</b>
5	4/30	<b>Chapter 9 Test &amp; EOC Skills #2</b>
6	5/2	Statistic Packet & <b>EOC Skills #3</b>
7	5/6	<b>EOC Review Section at 12:30 pm (427)</b>
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9	5/8	<b>EOC Review Section at 12:30 pm (TBA)</b>

# 9.1 Literal Equations, Arithmetic Sequence, Geometric Sequence

Literal Equations: Process of solving a indicated variable on a formula or equation. (Same as solving x on a linear equation.)

ex)  $2x + 4 = 6$

↑

$-4 \quad -4$

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$$\frac{2x}{2} = \frac{2}{2}$$

$$\boxed{x=1}$$

Ex1)  $\frac{7a}{7b} = \frac{c}{7b}$  (solve for a)

$$\boxed{a = \frac{c}{7b}}$$

Ex2)  $y = 4x + b$  (Solve for x)

$$\frac{-b}{-b}$$

$$\frac{y-b}{4} = \frac{4x}{4}$$

$$x = \frac{y-b}{4}$$

Try 1)

$A = 5c + 2b$  (Solve for c)

$$\frac{-2b}{-2b}$$

$$\frac{A-2b}{5} = \frac{5c}{5} \Rightarrow c = \frac{A-2b}{5}$$

Ex3)  $3A = \frac{1}{3}gh$  (Solve for g)

$$\frac{3A}{h} = \frac{gh}{h}$$

$$g = \frac{3A}{h}$$

Try 2)

$4S = \frac{1}{4}rh$  (Solve for h)

$$\frac{4S}{r} = \frac{rh}{r}$$

$$h = \frac{4S}{r}$$

Arithmetic Sequence: a sequence of numbers that have the **same difference** between each term.

(Same difference is called **Common Difference (d)**)

Ex4) 2, 4, 6, 8, 10, ...  $4-2=2$ ;  $6-4=2$ ;  $8-6=2$ ,  $10-8=2$   
 $\begin{array}{cccc} \checkmark & \checkmark & \checkmark & \checkmark \\ +2 & +2 & +2 & +2 \end{array}$       Next term - Previous term = d

Common difference (d) = 2      The next three terms:

Ex5) 1, -2, -5, -8, ...  $-2-1=-3$ ;  $-5-(-2)=-3$ ;  $-8-(-5)=-3$   
 $\begin{array}{ccc} \checkmark & \checkmark & \checkmark \\ -3 & -3 & -3 \end{array}$

Common difference (d) = -3      The next three terms:

-11, -14, -17

**Note:** If a sequence has **NO common difference**, it's **NOT** an Arithmetic sequence.

Ex) 3, 4, 6, 9, 13, ... (Not an Arithmetic Sequence!!)

$\checkmark \checkmark \checkmark \checkmark$   
+1 +2 +3 +4

Finding the  $n_{th}$  term of an Arithmetic Sequence:

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

↑ Any term you're looking for.  
↑ 1<sup>st</sup> term of the sequence  
↑  $n_{th}$  term you're looking for.

common difference  
Ex6) Find the **40<sup>th</sup>** term of

3, 6, 9, 12, ...  $d = 3$

$\checkmark \checkmark \checkmark$   
+3 +3 +3

$$a_{40} = 3 + (40 - 1)(3)$$

$$= 3 + 39(3)$$

$$= 3 + 117 = \boxed{120} = a_{40}$$

Ex7) Find the  $\frac{55^{\text{th}}}{n}$  term of 4, 2, 0, -2, -4, ...

$$a_{55} = 4 + (55 - 1)(-2) = 4 + 54(-2)$$

$$= 4 - 108 = \boxed{-104}$$

Ex8) Find the  $\frac{94^{\text{th}}}{n}$  term of 1<sup>st</sup> term = 5, d = -1.5

$$a_{94} = 5 + (94 - 1)(-1.5)$$

$$= 5 + 93(-1.5) = 5 - 139.5 = \boxed{-134.5}$$

Geometric Sequence: a sequence of numbers that have the **same ratio** between each term. (Means multiply the same number to get the next term.)

Same Ratio is called the **Common Ratio (r)**

Ex9) 2, 6, 18, 54, ...

$\begin{array}{ccc} \vee & \vee & \vee \\ \times 3 & \times 3 & \times 3 \end{array}$

$\frac{\text{Next term}}{\text{Previous term}} = \frac{6}{2} = 3 ; \frac{18}{6} = 3 ; \frac{54}{18} = 3$

Common Ratio (r) = 3

The next three terms:

162, 486, 1458

Ex10) 8, -4, 2, -1,  $\frac{1}{2}$ , ...

$\begin{array}{cccc} \vee & \vee & \vee & \vee \\ \times (-\frac{1}{2}) & \times (\frac{1}{2}) & \times (-\frac{1}{2}) & \times (\frac{1}{2}) \end{array}$

Common Ratio (r) =  $-\frac{1}{2}$

The next three terms:

$-\frac{1}{4}, \frac{1}{8}, -\frac{1}{16}$

Finding the  $n^{\text{th}}$  term of a Geometric Sequence:

$$a_n = a_1 r^{(n-1)}$$

Any term you're looking for.  
 1<sup>st</sup> term of the sequence.  
 common ratio.

Ex11) Find the 10<sup>th</sup> term of 3, 6, 12, 24, ...  $r=2$

$$a_{10} = 3 \cdot 2^{(10-1)}$$

$$= 3 \cdot 2^9 = 3 \cdot 512 = 1536$$

$y^x$   
 $x^y$   
 $\wedge$   
 2 9  
 ↙

Ex12) Find the 8<sup>th</sup> term of 8, 4, 2, 1,  $\frac{1}{2}$ , ...

$$\underbrace{\times \frac{1}{2}} \underbrace{\times \frac{1}{2}} \underbrace{\times \frac{1}{2}} \underbrace{\times \frac{1}{2}} = r$$

$$a_8 = 8 \cdot \left(\frac{1}{2}\right)^{8-1} = 8 \left(\frac{1}{2}\right)^7$$

$$= 8 \left(\frac{1}{128}\right) = \frac{\cancel{8}}{128} = \frac{1}{16}$$



Try1) Find the 20<sup>th</sup> term of the following **Arithmetic**  
Sequence: 19, 14, 9, 4, -1, ...

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

$$a_{20} = 19 + (20-1)(-5) = 19 + 19(-5) = 19 - 95 = \boxed{-76}$$

Try2) Find the 7<sup>th</sup> term of the following **Geometric**  
Sequence: 1, 3, 9, 27, 81, ...

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

$$a_7 = 1 \cdot 3^{7-1} = 3^6 = \boxed{729}$$