

## NOTES CATCHER

Key Vocabulary	Definition, Rule, or Facts	Example	My own words & wonderings
PART I			
<b>Sequence</b>	<ul style="list-style-type: none"> <li>an ordered list of numbers</li> <li>A function               <ul style="list-style-type: none"> <li>Whose <b>domain is the subset of integers</b> and <b>range is the set of values of terms</b></li> </ul> </li> <li>Can be described by an equation/rule</li> <li>Can be written as <b>function notation</b> <math>a(n)</math>, or <b>subscript notation</b> <math>a_n</math></li> </ul>	$a(n) = n^3$ <b>Domain:</b> {1, 2, 3, 4, 5} <b>Range:</b> {1, 8, 27, 64, 125}	<ul style="list-style-type: none"> <li>Like <b>input (x)</b> and <b>output (y)</b></li> <li>Why or when would you use a sequence instead of an equation?</li> </ul>
<b>Term</b>	<ul style="list-style-type: none"> <li>Each number in the list of a sequence               <ul style="list-style-type: none"> <li><math>n = 1 \rightarrow</math> 1st term of a sequence</li> </ul> </li> </ul>	$a_1 = 1 \rightarrow$ 1 is the 1st term $a_2 = 8 \rightarrow$ 8 is the 2nd term $a_3 = 27 \rightarrow$ 27 is the 3rd term $a_4 = 64 \rightarrow$ 64 is the 4th term $a_5 = 125 \rightarrow$ 125 is the 5 term	<ul style="list-style-type: none"> <li><b>Term number</b> is the <b>subscript</b>, (no mathematical value), <b>represents the position</b> in the sequence.</li> </ul>
PART II			
<b>Series</b> -Sigma notation, $\Sigma$ -Summation	<ul style="list-style-type: none"> <li>The <b>sum</b> of the terms in a sequence</li> <li>Add all the terms in the sequence to find the series</li> <li>Can be represented by sigma notation</li> <li>Or can use this formula:  <math display="block">S_n = \frac{n(a_1 + a_n)}{2}</math> <ul style="list-style-type: none"> <li><math>a_1 \rightarrow</math> first term of sequence</li> <li><math>a_n \rightarrow</math> last term of sequence</li> <li><math>n \rightarrow</math> number of terms</li> </ul> </li> </ul>	<u>example 1:</u> $\sum_{k=1}^5 5k$ $5(1) + 5(2) + 5(3) + 5(4) + 5(5)$ $5 + 10 + 15 + 20 + 25$ $= 75$ <u>example 2:</u> $\sum_{k=1}^{30} k + 2 = \frac{30(3+32)}{2} = 525$	<ul style="list-style-type: none"> <li>Does it matter if I use Sigma Notation or the formula?</li> <li>Do I have to memorize the formula?</li> <li>How will I know if it's a sequence or a series?</li> </ul> <b>STEPS for Calculating Summation from Sigma Notation:</b> <ol style="list-style-type: none"> <li>Find first term using <i>lower limit</i> &amp; the rule</li> <li>Find last term using <i>upper limit</i> &amp; the rule</li> <li>Substitute into formula  <math display="block">S_n = \frac{n(a_1 + a_n)}{2}</math> </li> <li>Simplify/Solve</li> </ol>
<b>Sigma Notation</b>	<ul style="list-style-type: none"> <li>Symbol <math>\rightarrow \Sigma</math></li> <li>A way to write a series               <ul style="list-style-type: none"> <li>Made up of 3 parts: The lower limit summation (<math>k = 1</math>) tells you what value to begin with, The upper limit summation (5) tells you where to stop, The rule, or expression, tells you what to substitute into</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Find first term:  <math>k = 1 \rightarrow 1 + 2 = 3</math></li> <li>Find last term:  <math>k = 30 \rightarrow 30 + 2 = 32</math></li> <li>Substitute into formula:  <math display="block">S_n = \frac{n(a_1 + a_n)}{2} \rightarrow \frac{30(3 + 32)}{2}</math></li> <li>Simplify/Solve  <math>\rightarrow = 525</math></li> </ul>	