Math 4 Honors
Lesson 5-7 Learning Check

Name_____
Date _____

In this learning check, you will be assessed on the following objectives:

- *I can use summation notation used to write sums.*
- *I can rewrite sums recursively.*

For #1 & #2, evaluate the series. *Show your work.*

1. $\sum_{n=4}^{8}(8n-3)$

225

2. $\sum_{n=-1}^{3} 96\left(\frac{1}{2}\right)^{n-1}$

744

3. Write using summation notation: $8100 + 2700 + 900 + 300 + 100$

$\sum_{i=1}^{5} 8100\left(\frac{1}{3}\right)^{i-1}$

Geometric
$a_1 = 8100$
$r = \frac{1}{3}$

4. Let $S(n)$ be the statement: $\sum_{i=1}^{n}\left(\frac{1}{i(i+1)}\right) = \frac{n}{n+1}$

a. Find $\sum_{i=1}^{8}\left(\frac{1}{i(i+1)}\right)$ and show true for $S(8)$.

$= \frac{8}{9}$

$S(8) = \frac{8}{8+1} = \frac{8}{9}$

b. Write $\sum_{i=1}^{n+1}\left(\frac{1}{i(i+1)}\right)$ recursively.

$\sum_{i=1}^{n+1}\left(\frac{1}{i(i+1)}\right) = \sum_{i=1}^{n}\left(\frac{1}{i(i+1)}\right) + \frac{1}{(n+1)(n+2)}$

c. Use (a) and (b) to find $\sum_{i=1}^{9}\left(\frac{1}{i(i+1)}\right)$.

$\sum_{i=1}^{8}\left(\frac{1}{i(i+1)}\right) + \frac{1}{(8+1)(8+2)}$

$\frac{8}{9} + \frac{1}{90} = .9$