Last Name:	First Name:
1.) Neither	13.) 9,900!
2.) <u>Geometric</u>	14.) (10,000 20
3.) Neither	15.)
4.)12	16.) $(x^{200}+3)^{300}+2$
5.)160	17.) R
6.)1,830	18.) R - {3 /2}
7.) 7(3) ⁵⁷	19.) 1
8.)164	20.) R-{7}
9.)570	21.) (-∞,2)
10.)15/2	_ 22.) _ ~2,8
11.) 10,000!	23.)
12.)40	_ 24.)No
* * * * * * * *	* * * * * * *
25.) $x^5 + 5x^4y + 10x^3y^2 + 10x^2y^3 + 5xy^4 + y^5$	



First Practice Exam

For #1-3, decide whether the given sequence is arithmetic, geometric, or neither.

- 1.) 3, 5, -7, -9, ... Neither
- 2.) -5, 10, -20, 40, ... Geometric
- 3.) 8, 5, 10, 4, ... Neither

4.) Find
$$\sum_{i=1}^{3} (3i-2)$$

 $\begin{bmatrix} 3(i)-2 \end{bmatrix} + \begin{bmatrix} 3(2)-2 \end{bmatrix} + \begin{bmatrix} 3(3)-2 \end{bmatrix}$
 $= \begin{bmatrix} 3-2 \end{bmatrix} + \begin{bmatrix} 6-2 \end{bmatrix} + \begin{bmatrix} 9-2 \end{bmatrix}$
 $= 1 + 4 + 7 = 12$
5.) Find $\sum_{i=1}^{40} 4$
 $4 - 0(4) = 160$

6.) Find
$$\sum_{i=1}^{60} i$$

 $\frac{60}{2} \left[1 + 60 \right] = 30(61) = 1830$

7.) What is the 58th term in the sequence $7, 21, 63, 189, \ldots$?

$$7(3)^{58-1} = 7(3)^{57}$$

8.) What is the 17th term in the sequence $4, 14, 24, 34, \ldots$?

9.) What is the sum of the first 20 terms of the sequence $0, 3, 6, 9, \ldots$?

$$\frac{29}{2}[0+0+3(19)] = 10[57] = 570$$

10.) What does the following series equal: $5 + \frac{5}{3} + \frac{5}{9} + \frac{5}{27} + \cdots$?

$$\frac{5}{1-\frac{1}{3}} = \frac{5}{\frac{2}{3}} = \frac{3}{2}(5) = \frac{15}{2}$$

11.) A library wants to arrange their 10,000 books in an order. One option is to order the books alphabetically, but how many different ways could they order their books?

12.) A library wants to buy three books: an adventure book, a nonfiction book, and a pamphlet on health issues. The library staff has narrowed its options down to four different choices for which adventure book to buy, five choices for which nonfiction book to buy, and two options for which pamphlet on health issues to buy. How many different different combinations of three books could they buy?



13.) A library has 10,000 books, and it wants to rank its 100 best books, from first to one hundredth. How many different rankings are possible?

$$\frac{10,000!}{(10,000-100)[} = \frac{10,000!}{9,900!}$$

14.) A library wants to choose 20 of its 10,000 books to put on a summer reading list. How many ways could the library choose 20 of its books?

15.) What is $\binom{10}{7}$? (Your answer should be a natural number in standard form.)

$$\frac{10!}{7!3!} = \frac{10.9.8.7!}{7!\cdot3.2} = 5.3.8 = 120$$

16.) If $f(x) = x^{200} + 3$ and $g(x) = x^{300} + 2$, then what is $g \circ f(x)$?

$$g \circ f(x) = g(x^{200} + 3) = 4 (x^{200} + 3)^{300} + 2$$

17.) What is the implied domain of $f(x) = 12x^2 - 4x + 5$?

R

18.) What is the implied domain of

$$g(x) = \frac{2x^2 + 3x - 7}{2x - 3}?$$

$$2x - 3 = 0 \implies 2x = 3 \implies x = \frac{3}{2}$$

$$\mathbb{R} - \{\frac{3}{2}\}$$

Below is the graph of a function f(x). Use this graph to answer questions #19-23.



- 19.) What is f(2)? 1
- 20.) What is the domain of $f? \mathbb{R} \{7\}$
- 21.) What is the range of $f?(-\infty, 2)$
- 22.) What are the x-intercepts of the graph of f? -2, 8
- 23.) What is the *y*-intercept of the graph of f?

24.) Is the picture below the graph of a function?



25.) Write out the product $(x+y)^5$ so that your final answer doesn't include numbers that look like $\binom{n}{k}$.

