Name: _____

Fall Semester

Sample Quiz Questions
Number Theory, Modular Arithmetic, & Spreadsheets

For the following, provide the best word or phrase that makes the statement both true and relevant in the context of this class.

1. The number of edges in a complete graph is always a ____ number

2. The mathematician _____ conjectured that every even number greater or equal to 6 can be written as the sum of two prime numbers

3. Two numbers are said to be _____ if they are prime numbers whose difference is 2

4. Any positive integer can be partitioned into at most three ___ numbers

5. Entering the expression =mod(32,5) into the cell of a spreadsheet would cause the cell to display ___

6. The first 6 pentagonal numbers are ___

7. In the context of number theory, $\pi(16) =$ ___

For the following questions, refer to the screen capture of the spreadsheet.

8. If you entered | D6+A3 | into cell B2, what would appear in cell B2?

9. If you entered | =”There are “ & F4 & E7 | into cell E1, what would appear in cell E1?

10. What would you need to enter into a cell to divide the sum of the values in cells G4 and G5 by the value in cell B7?

	A	B	C	D	E	F	G
1	18		4				
2							
3	2			P	Q	R	S
4		13	California	134	rabbit	red	652
5		15	Louisiana	958	cows	flower	887
6		19	Nevada	205	birds	green	1908
7		22	Texas	852	rats	blue	14.3
8	5	23	Vermont	123	steer	gardens	9.991
9		24	Virginia	76	buffalo	yellow	2.65
10							

For the following questions, you must show evidence of the steps you followed to arrive at your final answer.

11. Complete the Euclidean Algorithm to determine the GCF/GCD for the numbers 108 and 2184

12. In the context of number theory, what makes a number perfect?

13. In the context of number theory, give two examples of how the study of numbers was connected to religion.

Solve the following equations using only addition & multiplication. In order to receive full credit, you must show evidence of the steps you followed to arrive at your final answer.

14. $x + 20 \equiv 43 \,(\mathrm{mod}\,11)$

15. $2x + 13 \equiv 91 \,(\mathrm{mod}\,5)$

16. $11 + 3x \equiv 5 \,(\mathrm{mod}\,7)$

17. $15 - 4x \equiv 6 \,(\mathrm{mod}\,9)$

Conceptual/Reasoning

Answer the following using complete, well-formed, grammatically correct sentences.

18. In three or less sentences, explain/describe what a spreadsheet does and why it's useful.

19. Explain how/why our current place-value number system is more efficient than the Roman numeral system.

20. Explain the procedure you would follow to determine whether or not the number $135,341$ is prime using only paper, pencil, and a calculator.

21. Explain what the function $\pi(n)$ represents in number theory and discuss how finding more efficient/precise ways to calculate $\pi(n)$ would be helpful in the search for prime numbers.

22. Explain what the function $p(n)$ represents in number theory and discuss why this function is relevant.