

DO NOT TURN THIS PAGE UNTIL YOU ARE INSTRUCTED TO DO SO

- ❖ Write your name below on the space provided.
- ❖ This test has a total of 4 pages.
- ❖ Work the problem in the space provided. If you need more space, write on the back of the test.
- ❖ For some credit, draw an umbrella on this page.
- ❖ To insure maximum credit, show your work. In general, full credit will not be given for unsupported answers.
- ❖ Look only at your test. Don't give me the impression that you are cheating.
- ❖ Be sure to write neatly. If I cannot read what was written, do not expect the problem to be graded.
- ❖ If you finish early, go over the test again.

Good luck!

Number	Maximum	Score
1	3	
2	3	
3	20	
4	12	
5	3	
6	6	
7	4	
8	15	
9	8	
10	5	
11	6	
12	4	
13	5	
14	3	
15	3	
16	EC 9	
Total	100	

Name _____

Circle Final Answers
fancy!

1) (3 points) Write the first 12 counting numbers (starting with 1) in base 5. You do not have to write the subscript:

2) (3 points) Count from $52D_{\text{sixteen}}$ to 532_{sixteen} . You do not have to write the *sixteen* each time:

3) (5 points *a, b*; 10 points *c*) Convert the following numbers to the given base:

8) Convert the following numbers to the given base:

a) 514_{seven} to base 10

b) 2,330 to base 8

c) 1412_{six} to base 9

4) (3 points each) Label the following as either true or false. Use the word “true” or “false” to mark your answer. If false, explain why or give a counter-example:

a) $7|14$ _____

b) $8|4$ _____

c) If 2 divides into a number and 6 divides into the same number, then 12 also divides into that number.

d) If 12 divides into a number, then both 2 and 6 must also divide into that number.

5) (3 points) List the first 10 prime numbers:

6) (3 points each) Write the prime factorization for the following numbers:

a) 108

b) 350

7) (3 points) What is the divisibility test for...

a) 6?

b) 9?

8) (5 points each) Label the following numbers as perfect, abundant, or deficient. Be sure to show supportive work:

a) 6

b) 17

c) 24

9) (4 points each) A Harshad Number is a positive integer which is divisible by the sum of its digits. For example, the number 18 has digits 1 and 8 whose sum is 9. Note that $9|18$. Determine if the following numbers are Harshad Numbers. Be sure to show supportive work:

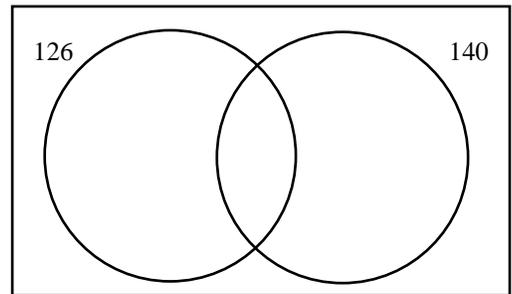
a) 24

b) 37

10) (5 points) Patrick needs to order a total of 46 SpongeBob hats for his math class. The hats are only sold in packs of 3, 7, and 11. How many of each pack would he need to get a total of 46 hats?

11) (6 points) For the numbers 126 and 140, find the GCF and the LCM using your favorite method. Be sure to label your answers:

12) (4 points) Using your work above, fill in the Venn Diagram for the numbers 126 and 140:



13) (5 points) SpongeBob, Patrick, and Sandy work at the Krusty Krab to check Krabby Patties for freshness. SpongeBob checks every 12th patty, Patrick checks every 8th patty, and Sandy checks every 21st patty. What will be the first patty checked by all three?

14) (3 points) Write the first 10 terms of the Fibonacci Sequence:

15) (3 points) List two things you learned about the Golden Ratio while watching *Donald Duck in Mathmagic Land*.

16) Extra Credit (1 point each): Match the event on the left with the item on the right:

- | | |
|---|-------------------|
| _____ Built the first ruler | A. Numbers |
| _____ Did not use numbers in their language | B. Capitalism |
| _____ Invented the binary calculator to try to eliminate human error | C. Warlpiri Tribe |
| _____ The reason that Roman Numerals were no longer used as the universal number system | D. Fibonacci |
| _____ Credited with inventing the number zero | E. Egyptian |
| _____ Credited with bringing Hindu-Arabic numbers to the West | F. Archimedes |
| _____ Developed the mathematics necessary to turn a sphere into cylinder which helped modern mapmakers | G. Pythagoras |
| _____ The world's first writing | H. Leibnitz |
| _____ Did not allow his followers to eat beans/Discovered that harmonies in music are combinations of whole numbers | I. India |