Number Theory Stretch

1. _____ Using exponents when prime factors are used more than once, what is the prime factorization of 504?

2. _____ factors How many positive factors does 504 have?

3. _____ What is the sum of the positive factors of 504?

4. _____ The base-8 number 1342_8 is equivalent to what base-10 integer?

5. _____ What is the smallest positive integer that has a remainder of 7 when divided by 8, a remainder of 8 when divided by 9 and a remainder of 11 when divided by 12?

6. _____ integers How many positive integers less than 101 are multiples of 3, 4 or 7?

7. _____ What is the smallest positive integer value of n such that $2^n + 5^n + 7^n$ is a multiple of 17?

8. (___ , ___) What are the coordinates of the first-quadrant point that lies on the graph of $7x + 13y = 99$ and has coordinates that are both integers? Express your answer as an ordered pair (x, y).

9. (___ , ___ , ___) Bill buys wigits for $3, gigits for $8 and pigits for $11. If Bill bought exactly 100 aliens for $400, and he purchased as few gigits as possible, what is the ordered triple (wigits, gigits, pigits) that represents his purchase?

wigit   gigit   pigit

10. _____ When the sum $2007^{2008} + 2008^{2007}$ is simplified to an integer, what is the ones digit?