

First name: _____ Last name: _____

Student ID: _____

Number Theory Homework

Basic problems:

1. Find the greatest common factor of each set of numbers.

1. 24, 52, and 44	2. 22, 16 and 73	3. 24, 43 and 32
4. 32, 56 and 98	5. 90, 96, and 10	6. 72, 59 and 92
7. 42, 84 and 36	8. 28, 47 and 68	9. 72, 24, and 96
10. 60, 12, and 36	11. 41, 24 and 44	12. 96, 80 and 84

2. Find the least common multiple.

1. 24, 6 and 18	2. 4, 12 and 48	3. 26, 8 and 13
4. 4, 6, and 10	5. 4, 8 and 32	6. 48, 12 and 18
7. 2, 11 and 12	8. 2, 4 and 14	9. 6, 24, and 54
10. 12, 4 and 7	11. 22, 8 and 10	12. 24, 3 and 12

3. Find the prime factorization of each number. Write the answer in exponential form.

1. 56	2. 80	3. 31	4. 12
5. 16	6. 43	7. 96	8. 48
9. 14	10. 27	11. 36	12. 8

4. Complete each divisibility table. Write yes if the number is divisible by the given number. Write no if it is not divisible by the given number.

1. 2,520	2. 66,736	3. 900	4. 48,949
by 2 _____	by 2 _____	by 3 _____	by 2 _____
by 3 _____	by 3 _____	by 4 _____	by 6 _____
by 4 _____	by 5 _____	by 7 _____	by 7 _____
by 6 _____	by 7 _____	by 8 _____	by 9 _____
by 9 _____	by 10 _____	by 9 _____	by 13 _____

5. Identify two numbers whose GCF is 22 and whose LCM is 220. Describe how you found the number.

6. Prime numbers tend to get less and less frequent as they get larger in the positive direction. Why do you suppose this is?

Word Problems

1. When placing each of the digits 2, 4, 5, 6, 9 in exactly one of the boxes of this subtraction problem, what is the smallest difference that is possible?

$$\begin{array}{r} \square \quad \square \quad \square \\ - \quad \square \quad \square \\ \hline \end{array}$$

- A) 58 B) 123 C) 149 D) 171 E) 176

2. Let o be an odd whole number and let n be any whole number. Which of the following statements about the whole number $(o^2 + no)$ is always true?

- A) it is always odd B) it is always even C) it is even only if n is even
D) it is odd only if n is odd E) it is odd only if n is even

3. Five friends compete in a dart-throwing contest. Each one has two darts to throw at the same circular target, each individual's score is the sum of the scores in the target region that are hit. The scores for the target regions are the whole numbers 1 through 10. Each throw hits the target in a region with a different value. The scores are: Alice 16 points, Ben 4 points, Cindy 7 points, Dave 11 points, and Ellen 17 points. Who hits the region worth 6 points?

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4. Alice and Bob play a game involving a circle whose circumference is divided by 12 equally -paced pedals. The points are numbered clockwise, from 1 to 12. Both start on point 12. Alice moves clockwise and Bob, count clockwise. In a turn of the game, Alice moves 5 points clockwise and Bob moves 9 points count clockwise. The game ends when they stop on the same point. How many turns will this take?

5. Pat Peano has plenty of 0's, 1's, 3's, 4's, 5's, 6's, 7's, 8's and 9's, but he has only 22 2's. How far can he number the pages of his scrapbook with these digits?

6. Several students are seated at a large circular table. They pass around a bag containing 100 pieces of candy. Each person receives the bag, takes one piece of candy and then passes the bag to the next person. If Chris takes the first and the last piece of candy, then the number of students at the table could be
A) 10 B) 11 C) 19 D) 20 E) 25

7. There are 24 four-digit whole numbers that use each of the four digits 2, 4, 5 and 7 exactly once. Only one of these four-digit numbers is a multiple of another one. Which of the following is it?
(A) 5724 (B) 7245 (C) 7254 (D) 7425 (E) 7542

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8. A palindrome is a whole number that reads the same forwards as backwards. If one neglects the colon, certain times displayed on a digital watch are palindromes. Three examples are: “1:01”, “4:44” and “12:21”. How many times during a 12-hour period will be palindromes?

9. Find the sum of the digits in the answer to where a string of 94 nines is multiplied by a string of 94 fours.

10. Barry wrote 6 different numbers, one on each side of 3 cards, and laid the cards on a table, as shown. The sums of the two numbers on each of the three cards are equal. The three numbers on the hidden sides are prime numbers. What is the average of the hidden prime numbers?

44	59	38
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