Name: _____

1. The human face uses 14 muscles to smile and 43 to frown. Which number is **prime** and which is **composite**? Explain.

2. It is estimated that Sophocles, an ancient Greek dramatist, died in 406 B.C. Find the prime factorization of 406.

3. There are 230 joints in the human body. Find the prime factorization of 230.

4. Jack is arranging his prized baseball cards in a frame. If he has 24 cards, in how many different numbers of rows and columns can he display them if each row has the same number of cards?

5. A marching band has 72 members. If they are to march with an equal number of people in each row, state all possible numbers of rows and numbers of people in each row.

6. Bill is arranging 108 photos to display on a poster board for a presentation. If he arranges an equal number of photos in each row, in how many different numbers of rows and columns can he arrange the photos?

7. The supreme example of Renaissance genius, Leonardo da Vinci, passed away (*muerto*) in 1519 A.D. Is 1519 a composite or prime number? Explain.

Before starting with the next problems, you must remember that:

The lowest common multiple (LCM) of two numbers is the smallest number which is a multiple of both numbers. For example, the lowest common multiple of 8 and 12 is 24 because it is the smallest number which is a multiple of both 8 and 12.

The highest common factor (HCF) of two numbers is the largest number which is a factor (divisor) of both of the numbers. For example, the highest common factor (HCF) of 8 and 12 is 4 because it is the largest number that is a factor of both 8 and 12.

The **lowest common multiple (LCM)** can be worked out for large numbers if each of the numbers is written as a product of its prime factors. The lowest common multiple **is the product of the highest power of all their prime factors.**

The **highest common factor (HCF) is the product of the lowest power of each of their common prime factors.**

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8. Frank has two flashing lamps. The first lamp flashes every 4 seconds. The second lamp flashes every 6 seconds. Both lamps start flashing together.
   a. After how many seconds will they again flash together?
   b. How many times in a minute will they flash together?

9. A class has more than 30 students but less than 40, and the class can be organised into rows of 8 that contain the exact same number of students. How many students does the class have?

10. Omar is planting trees. He has enough trees to plant 6, 7, or 14 trees in each row. What is the least number of trees Omar could have?

11. Mei has 15 oranges, 9 peaches, and 18 pears. She wants to put all of the fruit into decorative baskets. Each basket must have the same number of pieces of fruit in it. Without mixing fruits, what is the greatest number of pieces of fruit Mei can put in each basket? Explain.

12. The Line A bus arrives at the bus stop every 25 minutes, and the Line B bus arrives every 15 minutes. They are both at the bus stop right now. In how many minutes will they both be at the bus stop again?

13. Oscar needs to ship (*enviar*) 14 rock CDs, 12 classical CDs, and 8 pop CDs. He can pack only one type of CD in each box, and he must pack the same number of CDs in each box. What is the greatest number of CDs Oscar can pack in each box? Explain.

14. The high school marching band rehearses (*ensayar*) with either 6 or 10 members in every line. What is the least number of people that can be in the marching band?

15. Jill wants to put 45 sunflower plants, 81 corn plants, and 63 tomato plants in her garden. If she puts the same number of plants in each row and if each row has only one type of plant, what is the greatest number of plants Jill can put in one row? Explain.

16. Dante is planting his rose garden. He knows he can plant all of his roses by planting 12 or 15 rose bushes (*arbusto*) in every row. What is the least number of rose bushes Dante could have?

17. Every 7 years the Lancaster family has a family reunion. Every 6 years they update their family tree. If they both had a photo taken and updated their family tree in 1997, in what year will both events occur again?

18. The list shows the amounts of money the club leader collected from members for a camping trip. Each member paid the same amount. What is the most the camping trip could cost per member? Explain.

Wednesday $36	Thursday $54	Friday $72

19. Rebecca has 20 table tennis balls and 16 table tennis paddles. She wants to sell packages of balls and paddles bundled together. What is the greatest number of packages she can sell with no leftover balls or paddles?

20. In a promotion for a local delicatessen, every eighth customer will get a free sandwich and every sixth customer will get a free drink. Which customer will be first to get both a free sandwich and a free drink?

21. A radio station is giving away a discount coupon to every twelfth caller and a free concert ticket to every twentieth caller. Which caller will be first to win both the coupon and the ticket?