Math 6 Unit 1 quiz 3: Finding them from prime factorizations, Perfect, abundant, deficient and amicable numbers

Name _____ Date _____ Period _____

8 questions, 21 points

1. The LCM of 84 and 126 is 252. Use the product rule to find their GCF. Show your division. (2 points)

2. A number is 4 times a prime bigger than 4, and its proper factors add to 100. Find the number, showing how you found it. Is it perfect, abundant or deficient? (2 points)

3. Explain why no prime number can belong to an amicable pair. (2 points)

4. Find the GCF and the LCM of 150 and 700. Show the prime factorizations you use. (3 points)

5. $s(18) = 21$. Leah says that since 54 = 3 × 18, the sum $s(54)$ must be 3 × 21. (3 points)

(a) Find 3 × 21.

(b) List the proper factors of 54 and find $s(54)$.

(c) Multiply each proper factor of 18 by 3. Which proper factors of 54 are not on that new list?

6. (3 points)

(a) Find $s(9)$, $s(27)$ and $s(81)$.

(b) For each of the three, compare $2 \times s(n)$ with n. What pattern do you see?

(c) Use the pattern to predict $s(243)$, where $243 = 3^5$. Then check it by adding the proper factors.

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7. Diego is fencing a rectangular paddock 90 m wide and 140 m long. There is a post at each corner, and along every side the posts are the same whole number of meters apart, with the same spacing on all four sides. Diego wants to use as few posts as possible. How far apart should the posts be, and how many posts are needed in all? (3 points)

8. Two numbers have GCF $2^2 \cdot 3 \cdot 5$ and LCM $2^3 \cdot 3^2 \cdot 5 \cdot 7$. (3 points)

(a) Can one of the numbers be $2^4 \cdot 3 \cdot 5$? Explain.

(b) For each prime, one of the two numbers holds the power in the GCF and the other holds the power in the LCM. Use this to find every pair of numbers with this GCF and this LCM. Give each number as an ordinary number.

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