1. (a) $\boxed{42}$
   (b) $\boxed{48}$
   (c) $\boxed{15}$
   (d) $\boxed{63}$

2. (a) $\boxed{432}$
   (b) $\boxed{136}$
   (c) $\boxed{45}$
   (d) $\boxed{144}$

3. (a) $GCD(121, 748) : 748 - 121 = 627$. $GCD(627, 121) : 627 - 121 = 506$. $GCD(506, 121) : 506 - 121 = 385$. $GCD(385, 121) : 385 - 121 = 264$. $GCD(264, 121) : 264 - 121 = 143$. Now we come to $GCD(143, 121)$, which we easily see has the common divisor of $\boxed{11}$.
   (b) $GCD(92, 529)$ $\boxed{23}$

4. (a) GCD = 6, LCM = 36. $6 \times 36 = 12 \times 18 = 216$.
   (b) GCD = 24, LCM = 480. $24 \times 480 = 96 \times 120 = 11520$.
   We notice that $GCD(a, b) \times LCM(a, b) = a \times b$.

5. The question to ask with each of these problems is: is this a GCD or LCM? We have a big pile of marbles, and we want to divide it up into smaller piles. We know the amounts in the small piles, and we need to know how many are in the bigger pile. We know the LCM is bigger than the given numbers, so this is an LCM problem. Another clue is the problem says: *what is the SMALLEST number of marbles*, and smallest = least = LEAST common multiple. So we do $LCM(18, 42) = \boxed{126}$

6. LCM problem. $\boxed{\text{120 min: 5pm}}$

7. Is this question GCD or LCM? Jefferey wants to cut the rope smaller, so the answer will be smaller than the given numbers, so this is a GCD problem.

   (a) The question says: what is the GREATEST possible length...?. greatest = greatest common factor. $GCD(140, 168, 210) = \boxed{14 \text{ cm}}$

   (b) He cuts each of his pieces of rope into 14 cm pieces. So his 140 cm piece of rope becomes $140 \div 14 = 10$ small pieces, his 168 cm piece of rope becomes $168 \div 14 = 12$ small pieces, and his 210 piece of rope becomes $210 \div 14 = 15$ small pieces. So he now has $10 + 12 + 15 = \boxed{37}$ small pieces of rope.

8. LCM problem. $\boxed{\text{72 days: Dec 21}}$

9. If a common factor of two numbers is five, we know that each of the numbers has to be divisible by 5. Let's write the combinations of numbers that are both multiples of 5 and add up to 50:
   $5 + 45$, $10 + 40$, $15 + 35$, $20 + 30$, $25 + 25$.
   Now check the GCD's of each of these combinations of numbers:
   $GCD(5, 45) = 5, GCD(10, 40) = 10, GCD(15, 35) = 5, GCD(20, 30) = 10, GCD(25, 25) = 25$.

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The two possible combinations that meet these requirements are 5 and 45, or 15 and 35. Now we find their differences: $45 - 5 = \boxed{40}$; $35 - 15 =$ fbox20. (two acceptable answers).

10. LCM problem. $LCM(3, 5, 11) = 165$. If there is one student left over each time we arrange the students, then there is one extra student over 165. So there are 166 students at the parade. Check by dividing each number 3, 5, and 11 into 166, and you'll see you have a remainder of 1 each time. $\boxed{166}$

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