Warm-Up 2

41. Given that 5 glorps can be traded for 3 plaps, we can multiply both of these by 7 to find that Brian's 35 glorps should be worth 21 plaps. Tina only gave Brian 15 plaps, so she still owes him $21 - 15 = 6$ plaps. Since 2 plaps can be traded for 1 froop, we can triple both of these to find that 6 plaps should be worth 3 froops. That means Tina would have to give Brian **3** froops to make the trade fair.

42. The value of $(11^2 - 1) \div (5^2 - 1)$ is $(121 - 1) \div (25 - 1) = 120 \div 24 = \mathbf{5}$.

43. There are $3 \times 6 = 18$ teachers and $148 + 152 + 168 = 468$ students at Elliott Middle School. The ratio of teachers to students is 18 to 468, which simplifies to **1/26** as a common fraction

44. There are 26 letters in the alphabet, but there are 27 intervals from 0 to 3 on the number line. We want the letter at 2, which will be $2/3 \times 27 = 18$ intervals from 0. The 18th letter of the alphabet is **R**.

45. Fifty-seven percent of 200 is 114. If 114 is 300 percent of x, then x must be $114 \div 3 = \mathbf{38}$.

46. Todd should consume $30/100 \times 2400 = 720$ calories of protein each day. Since 1 gram of protein contains 4 calories, Todd should consume $720 \div 4 = \mathbf{180}$ grams of protein daily.

47. The value of seven factorial is $7! = 1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 = 5040$, and its prime factorization is $2^4 \times 3^2 \times 5 \times 7$. The positive four-digit integer will have to include the digits 5 and 7, but there is no way we can contain four factors of 2 and two factors of 3 in the other two digits. If we use the digit 9, we would still need $2^4 = 16$, which requires two more digits. If we use two digits of 6 along with the digits 5 and 7, then we have left out two more factors of 2. The answer is that there are **0** (zero) positive four-digit integers such that the product is 7!.

48. If $5x + 9 = 37$, then $5x = 28$. That means $15x = 28 \times 3 = 84$, so $15x + 16 = 84 + 16 = \mathbf{100}$.

49. We would expect Leonard's spinner to land on the letter P one quarter of the time, which is $72 \div 4 = \mathbf{18}$ spins.

50. There are 3 one-by-one rectangles, 2 one-by-two rectangles and 1 one-by-three rectangles, for a total of $3 + 2 + 1 = \mathbf{6}$ rectangles.