



Math Olympiad and Problem Solving Programs

F130 - Advanced Problem Solving

Problem Set 26.1 - Algebra Expressions

Name:

Date:

1. $\boxed{21 + n}$

2. The problem is kind of confusing. We know Ferry A has 55 people, but how many does Ferry B carry? You could interpret the sentence to mean it has f people on it, or it has f more than Ferry A, so $f + 55$. So the answer was either $\boxed{110 + f}$ or $\boxed{55 + f}$.

3. $\boxed{5b - 8}$

4. On Friday, David makes \$50. On Saturday, David makes $\$3x$. On Sunday, he makes $\$6$ more than two times of Saturday, so we do $6 + 2 \times \text{Saturday} = 6 + 2 \times 3x = 6 + 6x$. So in total, he made $50 + 3x + 6 + 6x = \boxed{9x + 56}$.

5. If you are confused about this problem, imagine the problem with just numbers.

Michael bought 20 bananas. During the weekend, his family ate one less than 13 of the bananas. How many bananas are still there? They ate 1 less than 13, or $13 - 1$, so he still has $20 - (13 - 1) = 20 - 13 + 1 = 8$ left. Let's use this same method to solve the problem with variables.

They ate 1 less than $13y$ bananas, which is $13y - 1$. So there are $20 - (13y - 1)$ bananas left, which simplifies to $20y - 13y + 1 = \boxed{7y + 1}$

6. Their total is \$10 less than $\$m$, or $m - 10$. They divide it up equally among the 6 people (Michelle plus 5 friends), so we divide the total by 6: $\boxed{\frac{m-10}{6}}$.

7. The formula for perimeter is $p = 2(l + w)$, where p is perimeter, l is length, and w is width. If we divide both sides by 2, we get $\frac{p}{2} = l + w$, or half of the perimeter is length plus width. Since the length is 6, we can replace the l in the equation with 6: $\frac{p}{2} = 6 + w$. So what must width be in order to make this equation true? $\boxed{\frac{p}{2} - 6}$.

8. The total cost was $\$25 + \$10s$. She gave the cashier \$40, so her change is $\$40 - (\$25 + \$10s) = \$40 - \$25 - \$10s = \boxed{\$15 - \$10s}$

9. Remember our average formula? *sum of numbers = average \times number of numbers*. So since we have 6 numbers whose average is n , then by the formula, the sum of the 6 numbers is $6 \times n = 6n$. Since average the first five numbers is 11, then the sum of the first five numbers is $5 \times 11 = 55$. Now imagine each of the numbers is a, b, c, d, e , and f . Then we have:

$$a + b + c + d + e + f = 6n$$

$$a + b + c + d + e = 55$$

So what must the last number (or f in this case) be? It is the difference of the sums! So the last number is $\boxed{6n - 55}$.

10. How many $\frac{1}{6}$'s are there in 1 whole? 6. So for each of the n wholes we have, there will be 6 $\frac{1}{6}$'s in each whole. So there are $\boxed{6n}$ $\frac{1}{6}$'s.