Commentary

Mars, XIII

1. **(18, 16, 21)** The pattern involves repeatedly adding 5, then subtracting 2. Then the sequence continues as: 13 + 5 = 18; 18 - 2 = 16; 16 + 5 = 21.

2. **(6)** The student can solve this problem by an organized guess and check strategy such as below.

#	quarters	dimes	nickels	total	
3	75¢	30¢	15¢	$1.20	
4	$1.00	40¢	20¢	$1.60	
5	$1.25	50¢	25¢	$2.00	
6	$1.50	60¢	30¢	$2.40	✔

   Some students might see that 3 of each is $1.20, so 6 must be $2.40. Others might start with 1 of each coin being 40¢, and then add 40¢ six times to get $2.40.

3. **(a. Bill; b. 10; c. Tom)** The student can visually see from the pictograph that Bill has the largest collection. A student may answer 2 for how many more Alan has than Tom; but each insect is worth 5 so the answer would be 5 x 2 or 10 more. Students can visually see that Tom has half of Bill's, or they may count Bill's as 6 and look for half of that, which is 3.

4. **(3:45)** A clock can be used to *work backwards* to the time he got home. He walked the dog for 30 minutes, and 30 minutes before 5:00 is 4:30. Counting back 45 minutes from 4:30 might be done in stages, first counting back by 30 minutes to get to 4:00, then 15 more minutes before 4:00 would be 3:45.

5. **(120)** At this grade level area is found by counting square units. The student can count all of the small squares shown, but many will take a short cut and add 12 ten times, or ten 12 times. Some might even multiply, if they have a calculator.

6. **(3, 4, 5 and 6)** Each block has a different number so the student can choose 4 of the numbers and add and then choose another 4 if the sum is not 18. The process can be repeated until the sum of 3 + 4 + 5 + 6 = 18 is reached. (Another approach is to add all of the 4 numbers and get 20, and then see which number to remove to have 18 as the sum.)

7. **(22)** This problem is one which will later be called *finding the mean*. At this point, students will likely not add the number of books and divide by 4. Instead, they might add the numbers to get 88, and then distribute the 88 in chunks, equally, among the four shelves. For example, they would likely give 20 to each shelf first, then 1 to each shelf, and then 1 more, exhausting the total of 88 books.

8. **(36)** A clue that makes this problem accessible is that the sum of the digits is 9. By listing these numbers -- 18, 27, 36, 45, 54, 63, 72, and 81 -- you can then search the list for the number for which the ones digit is twice the tens digit.

9. **(1)** The problem involves finding a fraction of a set, and then a fraction of a subsequent set, and seeing what is left. One-third of 3 cookies is 1 cookie, so Henry ate 1, leaving 2 cookies on the plate. Marsha ate half of two cookies, so she ate 1, leaving 1 on the plate for Art.