# Commentary
Jupiter, XXV

1. **(59,049)** Students may make a list to find a pattern. The pattern is increasing each clap by multiplying the previous distance by 3. This is also 3^{10}, which can be computed quickly on a calculator with a repeating function by this process:

$$\boxed{3}\ \boxed{\times}\ \boxed{3}\ \boxed{=}\ \boxed{=}\ \boxed{=}\ \boxed{=}\ \boxed{=}\ \boxed{=}\ \boxed{=}\ \boxed{=}\ \boxed{=}$$

claps - km	claps - km
1 - 3	6 - 729
2 - 9	7 - 2,187
3 - 27	8 - 6,561
4 - 81	9 - 19,683
5 - 243	10 - 59,049

2. **(4)** Pages 47 and 48 are back-to-back, but 20, 21, and 104 are all individual pages.

3. **(There are 3 basic ways to arrange the tiles, as below.)** Students can draw the three basic configurations and count to find the perimeter -- the area is always 4, since 4 tiles are used. One basic configuration is a square, another is 3 tiles together and another one on the side somewhere, and the third is 4 tiles in a row. Students will likely have other arrangements of these three basic shapes.

p = 8
a = 4

p = 10
4 = 4   or

p = 10
a = 4
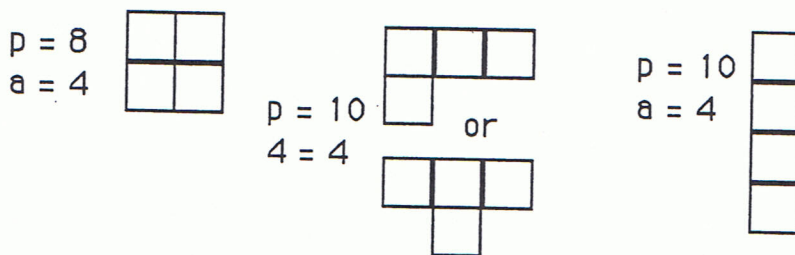
4. **(6)** Students can use the first initials and make a list: TJC, TCJ, CJT, CTJ, JCT, JTC

5. **(11 cherries)** Students may draw pictures or use letters. From the right-hand scale, we know that a piece of cake and 5 cherries can be substituted for an apple because they weigh the same. Therefore a piece of cake and 5 cherries can replace the apple in the right-hand pan of the left-hand scale. Therefore 2 pieces of cake balance 1 piece of cake and 6 cherries. One piece of cake is removed from both sides of this scale, leaving 1 piece of cake balancing 6 cherries. This means that 6 cherries can replace the piece of cake on the right-hand pan of the right-hand scale, leaving 1 apple to balance 6 + 5 or 11 cherries. There are other ways to reach this same conclusion. Such problems are important foundations for later work with algebra.

6. **(2, 4, 6, 8, 12, 14, 16, and 18 in left area;   10 and 20 in intersection;   5, 15, 25, 30, 35, 40, 45, and 50 in right area.)** A Venn diagram is a way to show visually the intersection of two sets. The intersection contains elements common to both sets.

7. **(7 and 12)** Students may use trial and error with addends or factor pairs. Some may begin the problem by listing the numbers that add to 19, and checking to see if their product is 84.

8. **($1.80)** 1/6 of 18 is 3 quarters or $0.75; 1/3 of 18 is 6 dimes or $0.60 and 1/2 of 18 is 9 nickels or $0.45. Students might want to draw 18 coins, and physically circle 1/3, 1/6, and 1/2 of the set.