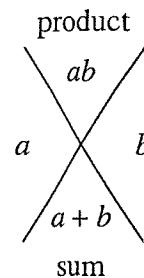


DIAMOND PROBLEMS

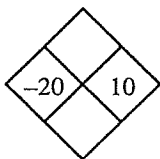
1.1.1

In every Diamond Problem, the product of the two side numbers (left and right) is the top number and their sum is the bottom number.

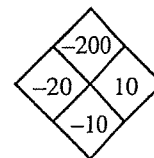
Diamond Problems are an excellent way of practicing addition, subtraction, multiplication, and division of positive and negative integers, decimals and fractions. They have the added benefit of preparing students for factoring binomials in algebra.



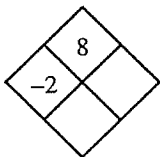
Example 1



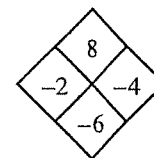
The top number is the product of -20 and 10 , or -200 . The bottom number is the sum of -20 and 10 , or $-20 + 10 = -10$.



Example 2



The product of the right number and -2 is 8 . Thus, if you divide 8 by -2 you get -4 , the right number. The sum of -2 and -4 is -6 , the bottom number.



Problems

Complete each of the following Diamond Problems.

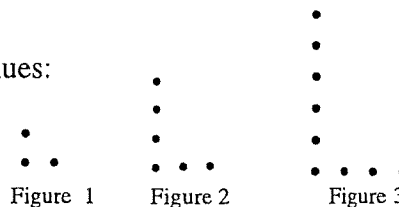
- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

Students are asked to use their observations and pattern recognition skills to extend patterns and predict the number of dots that will be in a figure that is too large to draw. Later, variables will be used to describe the patterns.

Example

Examine the dot pattern at right. Assuming the pattern continues:

- a. Draw Figure 4.
- b. How many dots will be in Figure 10?



Solution:

The horizontal dots are one more than the figure number and the vertical dots are even numbers (or, twice the figure number).

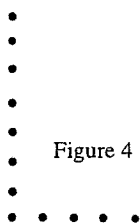


Figure 1 has 3 dots, Figure 2 has 6 dots, and Figure 3 has 9 dots. The number of dots is the figure number multiplied by three.

Figure 10 has 30 dots.

Problems

For each dot pattern, draw the next figure and determine the number of dots in Figure 10.

