THINKING WRITING

5.A Analyzing Graphs

You will need:

graph paper 

CONSTANT PRODUCTS

1. a. On the same pair of axes, graph the constant product function $xy = 24$ and the constant sum function $x + y = 10$.

b. Find and label the points where these two graphs intersect.

c. Add the graph of $x + y = 4$ to the same pair of axes. Does it intersect either graph?

2. If possible, factor each trinomial.

a. $x^2 + 10x + 24$

b. $x^2 + 4x + 24$

3. Explain the relationship between problem 1 and problem 2.

4. Make a large graph of the constant product equation. $xy = 36$. Show both branches on your graph.

5. On the graph of $xy = 36$, find two (x, y) pairs whose sum is 13. Plot and label these points, and connect them with a straight line. What is the equation of the line connecting these two points?

6. Add to your graph several lines of the form $x + y = S$, where S is an integer, as described below. Draw at least three lines

a. that intersect the graph of $xy = 36$ in the first quadrant. (Label the graphs and the points of intersection.)

b. that intersect the graph of $xy = 36$ in the third quadrant. (Label the graphs and the points of intersection.)

c. that never intersect the graph of $xy = 36$.

7. Consider the expression $x^2 + \_\_\_x + 36$. What numbers could you put in the blank to get a trinomial that can be factored? Explain your answer, giving examples.

CONSTANT SUMS

8. Make a large graph of the constant sum $x + y = 12$.

9. a. Find many (x, y) pairs whose product is 20.

b. Plot these points and connect them with a smooth curve.

c. What is the equation of the curve?

d. Where does it meet the graph of $x + y = 12$?

10. Add to your graph several curves with equations of the form $x \cdot y = P$, where P is an integer, as described below. Draw at least three curves

a. that intersect the graph of $x + y = 12$ in the first quadrant;

b. that intersect the graph of $x + y = 12$ in the second and fourth quadrants;

c. that never intersect the graph of $x + y = 12$.

11. Consider the expression $x^2 + 12x + \_\_\_$. What numbers could you put in the blank to get a trinomial that can be factored? Explain your answer, giving examples.

12. **Report** Summarize what you discovered in this lesson. Concentrate on the question: *How are the points of intersection of constant sum and constant product graphs related to factoring trinomials?* Use examples and illustrate your report with graphs. (The examples given in this lesson involved only positive whole numbers for the sums and products. In your report, you may use negative numbers or zero.)