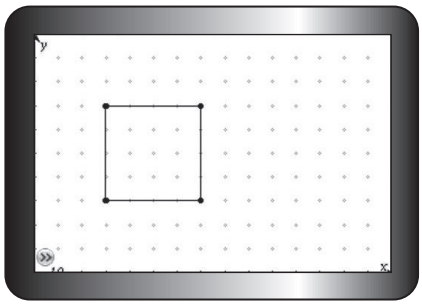
Applying Problem-Solving Strategies

Exponential Hit

YOU WILL NEED

- graphing calculator

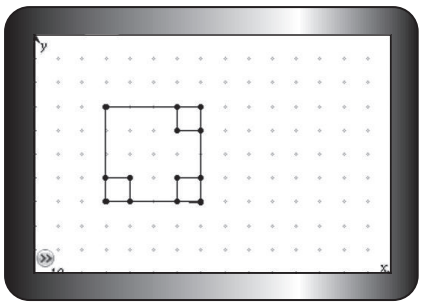
Create an exponential function so that the function passes through an opponent's square. Players win by discovering all of their opponent's squares.

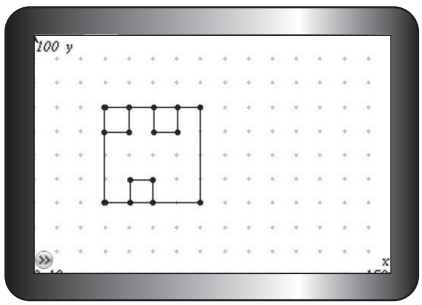


The Game

A. Both players need to construct the same playing grid on their graphing calculators; for example, a grid with the coordinates (30, 30), (30, 70), (70, 30), and (70, 70). Both players also need to have their calculators set to the same window.

B. Each player secretly draws three boxes in the grid. Two examples are presented below.





C. Players decide if they will allow only increasing exponential functions, only decreasing exponential functions, or both.

D. Players decide who will go first, using "rock, paper, scissors" or a similar technique.

E. One player calls out an exponential function. The other player enters this function into his or her calculator and determines if the function intersects any of his or her own squares. If it does, the player must declare that the square has been "hit." If it does not, the player who graphed the function must declare how the function missed the square by using words such as left, right, above, or below.

F. Players take turns calling out functions. The player with one or more squares remaining, when all the other player's squares have been hit, is the winner.

The Strategy

G. Suggest some characteristics of functions that are more likely to be hit. Are there locations that make squares less likely to be hit?

Variation

H. Suggest some variations of the rules to improve the game.