

## ACTIVITY 11.6

### Using Technology

Technology Activity for use with Lesson 11.6

## Investigating Experimental Probability

In Lesson 11.6 you found the *theoretical probability* of a dart landing in a region on a dart board. You can also find the *experimental probability* of this event using a graphing calculator simulation.

#### STUDENT HELP



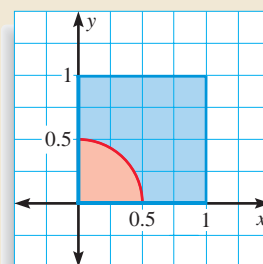
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### ► INVESTIGATE

- 1 Calculate the theoretical probability that a randomly thrown dart that lands on the dart board shown below will land in the region shaded red.
- 2 To find the experimental probability, you can physically throw a dart many times and record the results. You can also use a graphing calculator program that simulates throwing a dart as many times as you like. You can simulate this experiment on a TI-82 or TI-83 graphing calculator using the following program.

PROGRAM: DARTS

```
:ClrHome
:Input "HOW MANY THROWS?",N
:0 → H
:For (I, 1, N)
:rand → X
:rand → Y
:If  $(X^2 + Y^2) < 0.25$ 
:H + 1 → H
:End
:Disp "NUMBER OF HITS",H
```



- 3 Enter and run the program to simulate 40 throws. Determine the proportion of darts thrown that landed in the region shaded red.

### ► CONJECTURE

1. Explain why " $(X^2 + Y^2) < 0.25$ " is in the program.
2. Compare the theoretical and experimental probabilities you found in Steps 1, 2, and 3.
3. Find the experimental probability for the entire class by combining the number of throws and the number of hits and determining the proportion of dart throws that landed in the region shaded red.
4. How does the number of trials affect the relationship between the theoretical and experimental probabilities?

### EXTENSION

**CRITICAL THINKING** The results of a calculator simulation tend to be more reliable than those of a human-generated simulation. Explain why a calculator simulation would be easier and more accurate than a human-generated one.