

4. Take each dart one at a time and for each dart:
 - a. With your eyes still covered, throw the dart randomly (but assume that your throwing skills ensure that it will land somewhere on the square dartboard).
 - b. Record whether or not the dart landed inside the circle.
5. When you have thrown all the darts, divide the number that landed inside the circle by the total number, n , of darts you threw and multiply by 4. This will give you your estimate for π .

Figure 1.1 shows the scenario.

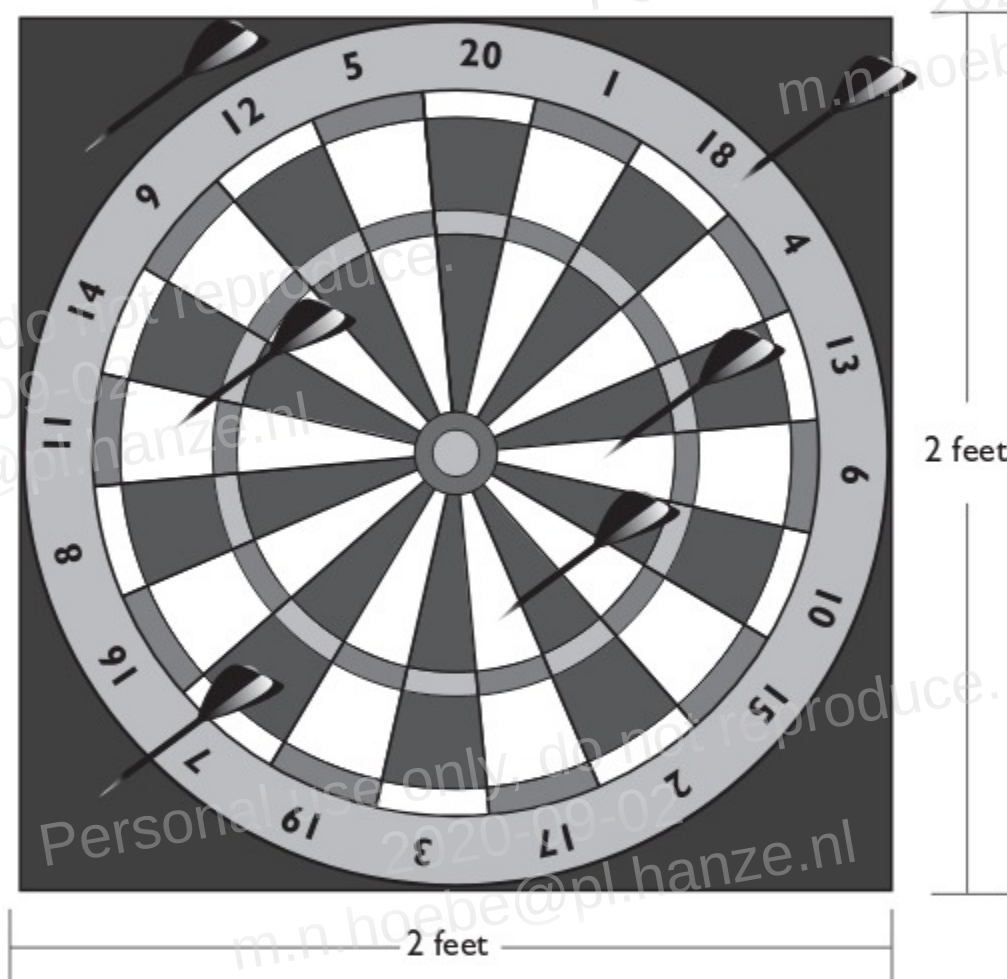


Figure 1.1: Using a dartboard to approximate π



That's the description of the algorithm, but why does it work? Here's why: the area of the circle is πr^2 , which is π in this case because we made the radius of the board to be 1. The area of the square is 4. Since we're assuming that darts are equally likely to end up anywhere in the square, we expect the number of them that land in the circle to be proportional to the ratio of the area of the circle to the area of the square: $\pi/4$. Therefore, if we throw n darts and deter-