

The Area of a Circle

Activity 1. Counting Unit Squares

As we saw before, the area of a flat figure is given by the number of unit squares that can fit inside. So in principle, you could determine the area of a circle by using a grid. You would have to count how many squares fit completely inside, and how many additional fractions of squares you also need to count (see figure 1).

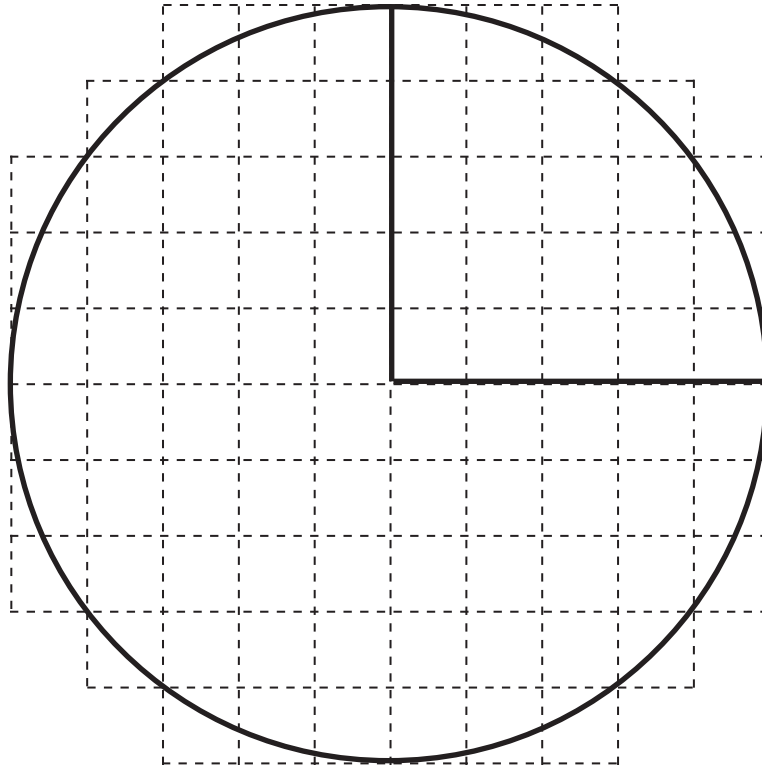


Figure 1. Circle in grid of square cm.

This approach, although conceptually very illuminating, has the disadvantage that when we actually count squares the estimation obtained thus is not very exact.

Exercise

Count the number of unit squares contained in a quarter of the circle. Make sure you include in your count fractions of squares contained. Multiply by four to estimate the total area of the circle.

In principle we could obtain better estimations by using a finer grid. The error would be less, but the disadvantage is that it would be too time consuming. Instead, we will use a different strategy to compute the area of a circle, by comparing the total area to the area of a radius squared.