

Reading Assignment

Read Chapters 3 and 4

Problem #1: Significant Digits

How many significant digits do each of the following numbers have?

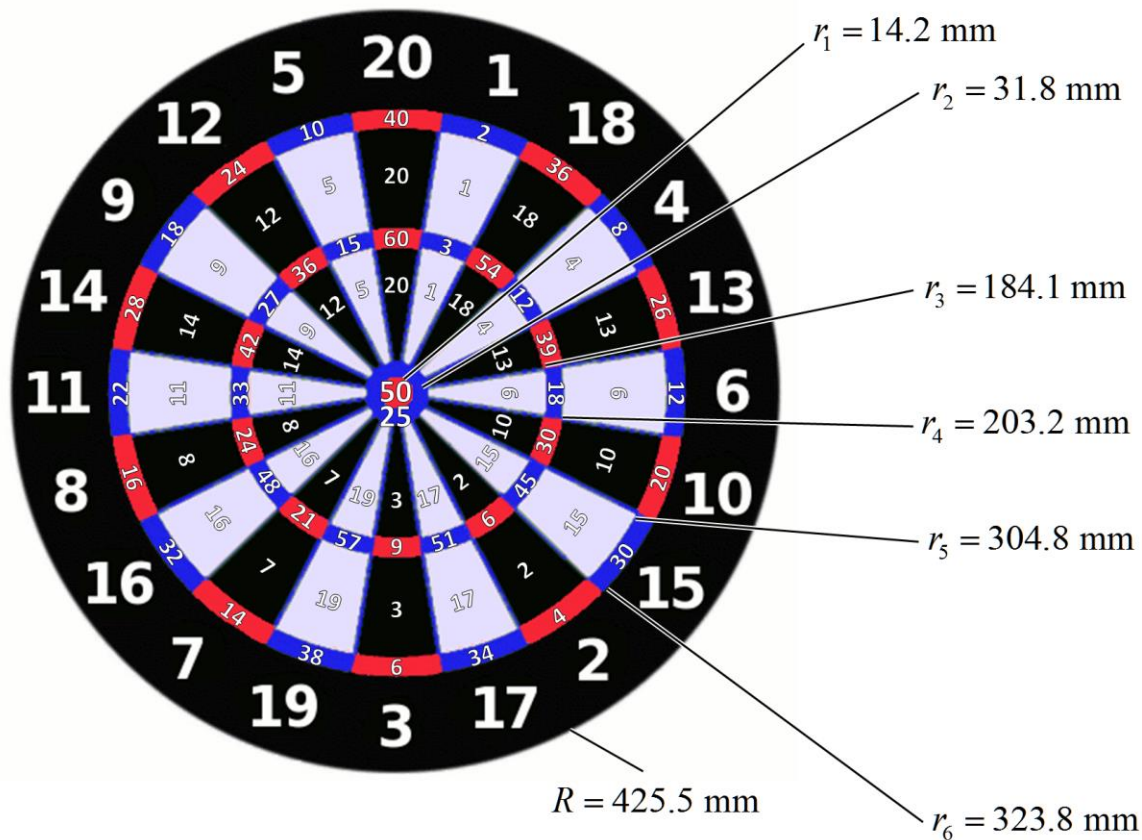
- a. 4.1234
- b. 0.0017
- c. 67,000
- d. 6.02214×10^{23}
- e. 600.8×10^{-12}

Problem #2: Error

Given the function $f(x) = 1 + \log_{10}(x)$, what is the true error Δf of this function if the true error of $\tilde{x} = 3.17$ is $\Delta x = 0.1$? Solve this problem by hand.

Problem #3: Build a Dartboard on a Cartesian Grid

The standard English dartboard is shown below. It is composed of the numbers 1 to 20 arranged randomly as wedges in a pie so each wedge spans 18°. The inner bullseye is worth 50 points while the outer bullseye is worth 25 points. Within the outermost ring the number score is doubled. Inside the middle ring, the number score is tripled. The number scores in each of these regions are provided in the figure. The approximate dimensions of the radii describing these regions are also provided.



Write a MATLAB program to build a standard English dartboard onto a Cartesian grid with 512x512 points. This should be a single array with values assigned to each point in a manner that describes the dartboard. Visualize the data in your array to a figure window and include the image in your homework solution. Remember to include your MATLAB code in an Appendix.

Hints:

1. Use `meshgrid()`.
2. Use `atan2()`.
3. Your data should look like the figure to the right.
4. Do not use `for` loops to fill in pixels in your grid.

