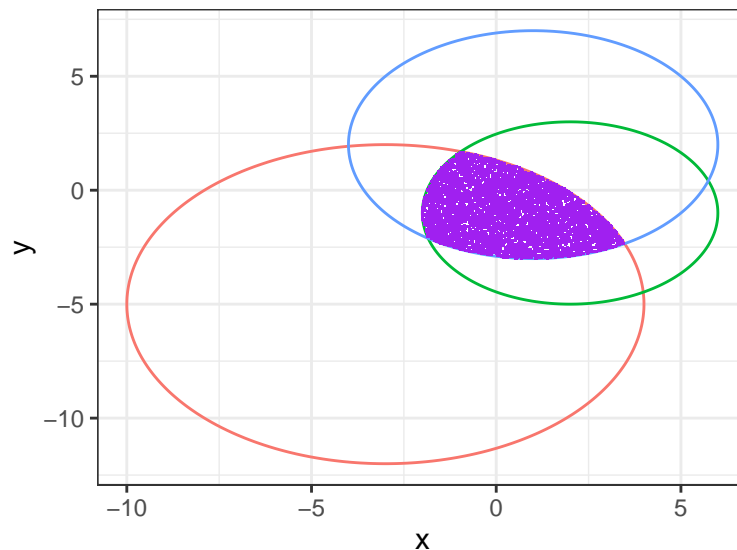


## Using R/RStudio

Use the flight data and answer the following questions (remove any canceled or diverted flights).

1. Which airline had the most and least departures between 01May19 and 15May19?
2. Which airline had the most and least departures between 01May20 and 15May20? Compare your results with the previous question and draw a conclusion.
3. Write a function to find the area ( $km^2$ ) of the intersection of three circles (purple region) defined by the below table.



Name	Vertex	Radius
Circle1	(1, 2)	5
Circle2	(-3, -5)	7
Circle3	(2, -1)	4

Hint: You can use what's known as "Monte Carlo Simulation" (you'll cover this in depth later) to estimate the area of a shape when integration is difficult (or impossible). I'll start you out with the basic algorithm.

1. Create a shape with known vertices which completely encloses the shape in question. This shape should have an easy-to-calculate area (think rectangle).
2. Generate some number of random points inside of the enclosing shape (usually a lot, depends on the area in question).
3. Determine how many of those points all inside the shape whose area you're estimating.
4. Multiply the enclosing shape's area by the proportion of points which fall inside the shape in question.
5. Report.