**CMSC425 Spring 2019**
**Instant homework 1**
Assigned Wednesday, Feb. 13th
Due by class on Monday, Feb. 18th

**Problem:**

Given a point **p**, a vector **v**, and a circle defined by a center **c** and a radius **r**. All in 2D.

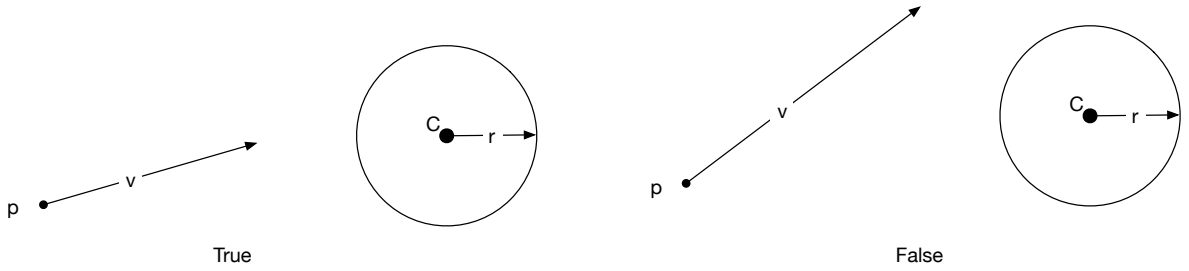
Give a Boolean answer to the question:

Does the ray defined by **p** and **v** intersect the circle defined by **c** and **r**?

The ray is the half line defined by r(t) = p + tv with t in [0,inf].

We will not worry about grazing the circle – that case can be in, or out. That's if the ray is perfectly tangent to the circle.

Here's two examples.




The solution should be a sequence of steps defined as equations (you don't need to write the Unity code to do it, but feel free to add that if you want.)

There are multiple solutions (at least three I can think of offhand.) Describe two, give one in detail. So for one you can be casual and give the idea, for the second you need to give accurate equations.

To submit you should:

1) Do it neatly on a computer or by hand.
2) Submit it to the InstHw1 assignment on Elms as a PDF.
3) Turn it in on Monday (this is redundant, both paper and PDF, that's intended.)

Instant homeworks are intended to follow up something in class, be one (or two) problems at most, and be worth something but not a killer percentage of the semester grade. They can be announced with no lead time. Bigger homeworks will have more time to solve.