PROBLEM 3.7

Given the coordinates C(x,y) of the center of the circle and its radius r, write a program that will determine whether a point P(h,k) lies inside the circle, on the circle, or outside the circle.

Distance between P(x,y) and centre C(h,k) is:

$$D = \sqrt{(x-h)^2 + (y-k)^2}$$

> If $D < r$, the point lies inside the circle.
> If $D = r$, the point lies on the circle.
> If $D > r$, the point lies outside the circle.

ALGORITHM

1. Start
2. Declare float variables x,y,h,k,d,r
3. Input x,y
4. Input h,k
5. Input r
6. Calculate the cartesian distance between (x,y) and (h,k) and assign it to d
7. If d < r, display "The point is inside the circle"
8. Else If d = r, display "The point is on the circle"
9. Else, display "The point is outside the circle"
10. Stop

PSEUDOCODE

```
DECLARE FLOAT x,y,h,k,d,r
INPUT x,y
INPUT h,k
INPUT r
ASSIGN sqrt((x-h)^2 + (y-k)^2) to d
IF d < r
    DISPLAY "The point is inside the circle"
ELSE IF d = r
    DISPLAY "The point is on the circle"
ELSE
    DISPLAY "The point is outside the circle"
ENDIF
```

FLOWCHART

```
flowchart TD
a([Start]) --> b[[Declare float variables x,y,h,k,d,r]]
b --> c[/Input x,y/]
```

```
c --> d[/Input h,k/]
d --> e[/Input r/]
e --> f["Calculate the cartesian distance between (x,y) and (h,k)" and assign it to d]
f --> g{If d < r}
g --> |True| h[/Display "The point is inside the circle"/]
g --> |False| i{if d == r}
i --> |True| j[/Display "The point is on the circle"/]
i --> |False| k[/Display "The point is outside the circle"/]
h --> l([Stop])
j --> l
k --> l
```