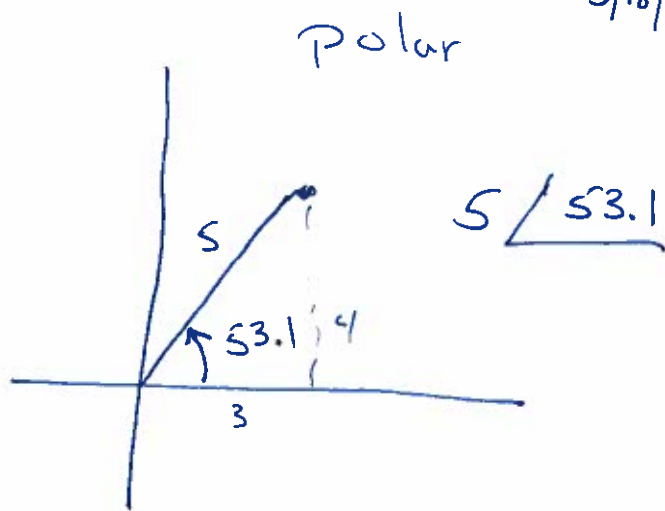
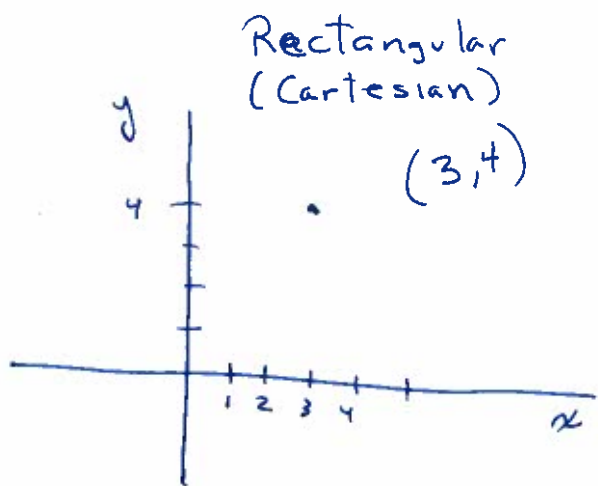


3/18/2019



How to ~~convert~~ change $x, y \Rightarrow r$ & theta

$$r = \sqrt{x^2 + y^2}$$

$$\theta = \text{arctan}\left(\frac{y}{x}\right) \quad \text{in } c \quad \text{atan2}(y, x)$$

↑
arctan

radian



$$360^\circ = 2\pi \text{ radians}$$

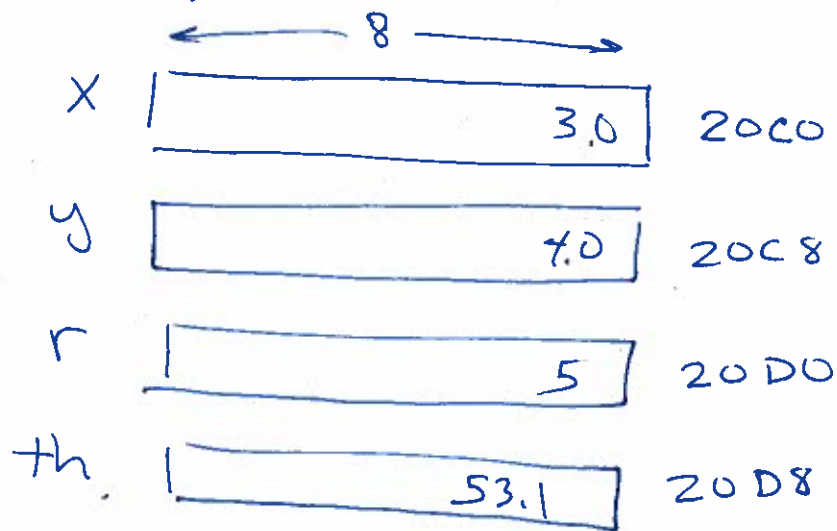
$$180^\circ = \pi \text{ radians}$$

Write a function that takes x, y and calculates a R, θ

```
void c2p (double x, double y,  
          double* pR, double* pTh )  
{  
    double angle, sum, r;  
    sum = pow(x, 2) + pow(y, 2);  
    r = sqrt(sum);  
    angle = atan2(y, x); // angle in radians  
    *pR = r;  
    *pTh = angle * 180.0 / 3.14159265358979323;  
}
```

```
1 #define _CRT_SECURE_NO_WARNINGS
2 #define PI 3.14159265358979323
3 #include <stdio.h>
4 #include <math.h>
5 void c2p(double x, double y, double* pR, double* pTh);
6
7 int main()
8 {
9     double x, y, r, th;
10    printf("Enter x and y: "); scanf("%lf %lf", &x, &y);
11    c2p(x, y, &r, &th);
12    printf("(%.2lf,%.2lf)=%.2lf /_ %.2lf\n",x,y,r,th);
13    return 0;
14 }
15 void c2p(double x, double y, double* pR, double* pTh)
16 {
17     double angle, sum, r;
18     sum = pow(x, 2) + pow(y, 2);
19     r = sqrt(sum);
20     angle = atan2(y, x);
21     *pR = r;
22     *pTh = angle * 180.0 / PI;
23 }
```

Scope
Main()



Scope C2P

