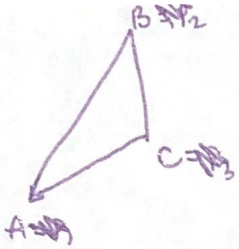


AB MIDPOINT

$$\left(\underbrace{\frac{A.x+B.x}{2}}_{x_1}, \underbrace{\frac{A.y+B.y}{2}}_{y_1}\right)$$

PERP. AB SLOPE

$$\frac{-1}{\left(\frac{A.y-B.y}{A.x-B.x}\right)}$$

EQ OF LINE AB

$$y-\frac{A.y+B.y}{2} = \frac{-1}{\left(\frac{A.y-B.y}{A.x-B.x}\right)}\left(x-\left(\frac{A.x+B.x}{2}\right)\right)$$

AC MIDPOINT

⋮

AC EQ.

$$y-\frac{A.y+C.y}{2} = \frac{-1}{\left(\frac{A.y-C.y}{A.x-C.x}\right)}\left(x-\left(\frac{A.x+B.x}{2}\right)\right)$$

$$y = \frac{-1}{\left(\frac{A.y-C.y}{A.x-C.x}\right)}\left(\frac{2x}{2}-\left(\frac{A.x+C.x}{2}\right)\right)$$

$$y = \left(\frac{C.x-A.x}{A.y-C.y}\right)\left(\frac{2x-Ax-C.x}{2}\right)$$

$$y-3 = 2(x-1)$$

$$[y+1 = 4(x+3)$$

$$y = 4(x+3)-1$$

$$4(x+3)-1-3 = 2(x-1)$$

$$\left(\frac{C.x - A.x}{A.y - C.y}\right)\left(\frac{2x - A.x - C.x}{2}\right) - \left(\frac{A.y + B.y}{2}\right) = \left(\frac{B.x - A.x}{A.y - B.y}\right)\left(\frac{2x - A.x - B.x}{2}\right)$$

$$\left(\frac{C.x - A.x}{A.y - C.y}\right)\left(x - \left(\frac{A.x + C.x}{2}\right)\right) - \left(\frac{A.y + B.y}{2}\right) = \left(\frac{B.x - A.x}{A.y - B.y}\right)\left(x - \left(\frac{A.x + B.x}{2}\right)\right)$$

$$\left(\frac{C.x - A.x}{A.y - C.y}\right)\left(x - \left(\frac{A.x + C.x}{2}\right)\right) - x\left[\frac{C.x - A.x}{A.y - C.y}\right] - \left(\frac{C.x - A.x}{A.y - C.y}\right)\left(\frac{A.x + C.x}{2}\right) - x\left[\frac{B.x - A.x}{A.y - B.y}\right] - \left(\frac{B.x - A.x}{A.y - B.y}\right)\left(\frac{A.x + B.x}{2}\right)$$

$$= \frac{A.y + B.y}{2}$$

$$x\left[\frac{C.x - A.x}{A.y - C.y}\right] - x\left[\frac{B.x - A.x}{A.y - B.y}\right] = \frac{A.y + B.y}{2} + \left(\frac{C.x + A.x}{A.y - C.y}\right)\left(\frac{A.x + C.x}{2}\right) + \left(\frac{B.x - A.x}{A.y - B.y}\right)\left(\frac{A.x + B.x}{2}\right)$$

$$x\left(\left[\frac{C.x - A.x}{A.y - C.y}\right] - \left[\frac{B.x - A.x}{A.y - B.y}\right]\right) =$$

$$x =$$

(2)

AB

$$Y_1 = \left(\frac{B.X - A.X}{A.Y - B.Y}\right)\left(X - \left(\frac{AX+BX}{2}\right)\right) + \frac{A.Y+B.Y}{2}$$

↑ KNOWN

WE HAVE

$(X_1, Y_1) \rightarrow$ CIRCLE CENTER (CIRCUMCENTER)

NEED: RADIUS

$(r\sin\theta, r\cos\theta)$

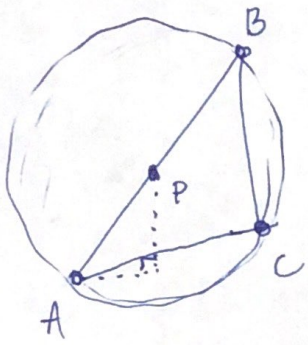
$(2,3) \rightarrow$ CENTER POINT, RADIUS = 2

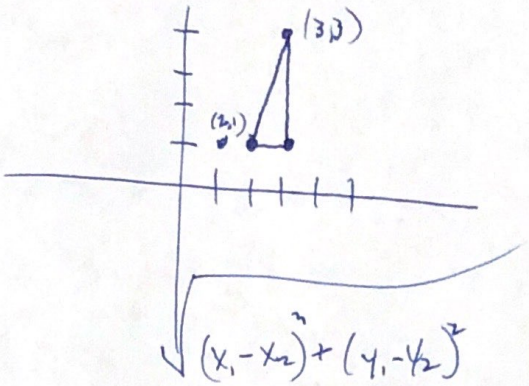
$x_p = r\cdot\cos\theta \quad x_p = 2\cdot\cos\theta$

$y_p = r\sin\theta \quad y_p = 2\cdot\sin\theta$

θ	x	y
0	2	
$\frac{\pi}{6}$	$\sqrt{3}$	
$\frac{\pi}{3}$	1.732	
$\frac{\pi}{2}$	*	
$\frac{2\pi}{3}$	⊖	
$\frac{5\pi}{6}$	fc	
π		

θ	x	y
0	2	0
$\frac{\pi}{6}$	1.732	1
$\frac{\pi}{3}$	1	1.732
$\frac{\pi}{2}$	0	2
$\frac{2\pi}{3}$	-1	1.732
$\frac{5\pi}{6}$	-1.732	1
π	-2	0





RADIUS IS DISTANCE FROM ANY POINT TO CIRCUMCENTER (P)

$$r = \sqrt{(P.x-A.x)^2+(P.y-A.y)^2}$$