PENANG SANGAM HIGH SCHOOL
DEPARTMENT OF MATHEMATICS/PHYSICS
YEAR 11 MATHEMATICS - WEEK 20

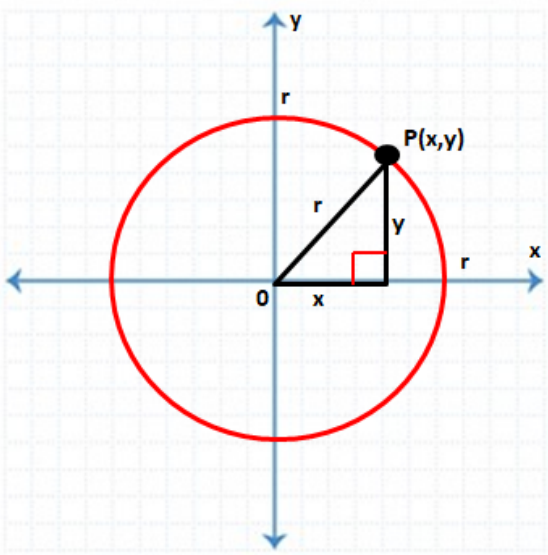
STRAND 4 **GRAPHS**
Sub – Strand 4.1 **GRAPHS**

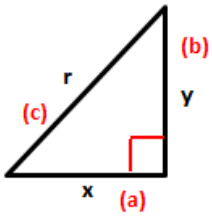
Learning Objective
At the end of this lesson, students should be able to:
- Draw circular graphs

Circle

- **Circle** – is a set of points equidistant from a fixed point called center.

Circles with center at the Origin





Taking a point P(x,y) on the circumference and drawing a right angled triangle we get the expression

$$c^2 = a^2 + b^2$$

$$r^2 = x^2 + y^2$$

This shows that a circle with its center at the origin (0,0) and a radius r has the equation

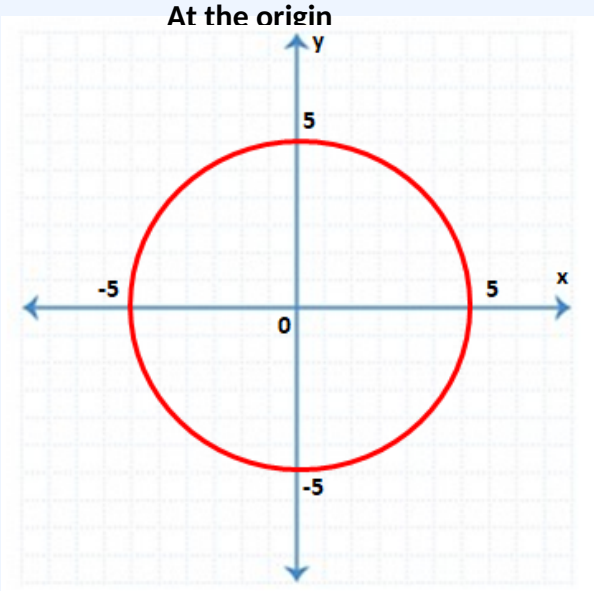
$$x^2 + y^2 = r^2$$

Example: **Sketch the circle** $x^2 + y^2 = 25$

$x^2 + y^2 = 25$ $\therefore r = 5$

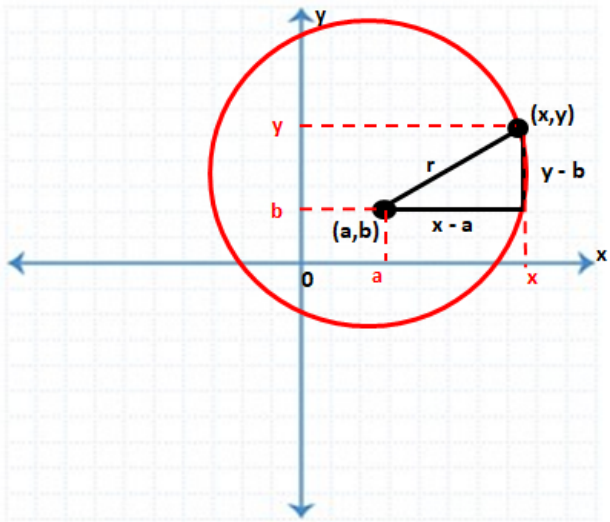
$x^2 + y^2 = 5^2$ **Center: (0,0)**

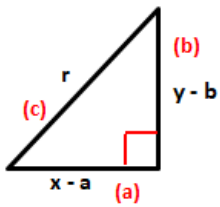
At the origin



Circles with center at (a,b)

- The circle is all the points (x,y) that are "r" away from the center (a,b)





$$c^2 = a^2 + b^2$$

$$r^2 = (x - a)^2 + (y - b)^2$$

This shows that a circle with its center at (a,b) and a radius r has the equation

$$(x - a)^2 + (y - b)^2 = r^2$$

That is the "Standard Form" for the equation of a circle

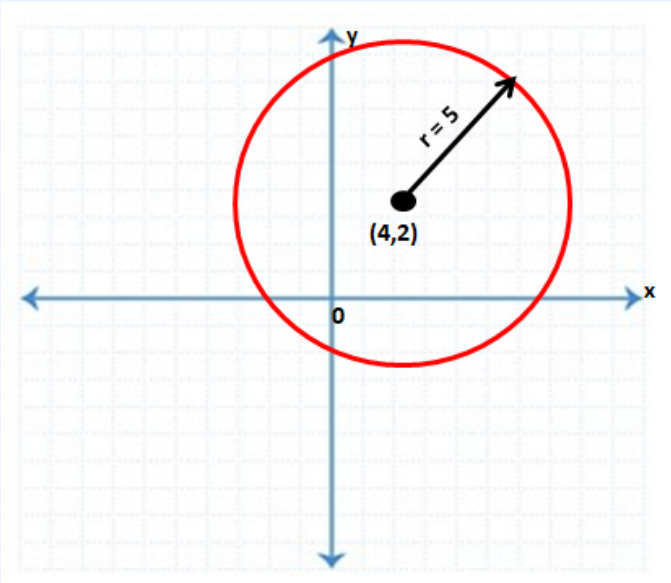
Note: *The general form of the equation of a circle is*

$$x^2 + y^2 + Ax + By + c = 0$$

Example: **Plot** $(x - 4)^2 + (y - 2)^2 = 25$

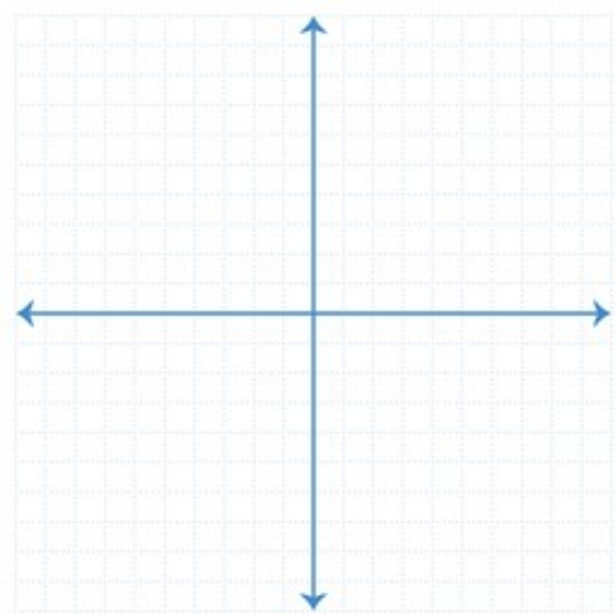
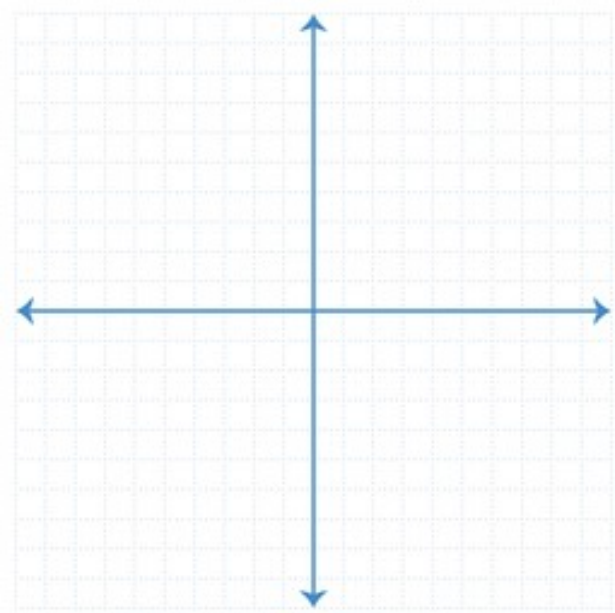
$(x-a)^2+(y-b)^2=r^2$ **Center is at (4,2)**

$(x-4)^2+(y-2)^2=25$



<u>Exercise</u>: Plot the following circles

a) $x^2+y^2=16$



b) $(x-4)^2+(y-2)^2=25$