Week 2 Thursday

January 17, 2019 7:53 AM

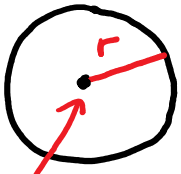
$(-1)^2 = (-1)(-1) = 1$

$(-1)^3 = (-1)(-1)(-1) = -1$

$-1^2 = -1$

Quiz Tues Section 2.2

2.4 Circles



radius = r

Centre = (h,k)

Standard Form of Circle

$$(x-h)^2 + (y-k)^2 = r^2$$

Know this ⍟

Ex: Write the standard form

a) radius = 4 centre = (0,0)

$(h,k) = (0,0)$ $r^2 = 16$

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

b) radius $= 3\sqrt{3}$ Centre $= (-1, 2)$

$h = -1$ $k = 2$ $r^2 = (3\sqrt{3})^2$

$= 9 \cdot 3$

$= 27$

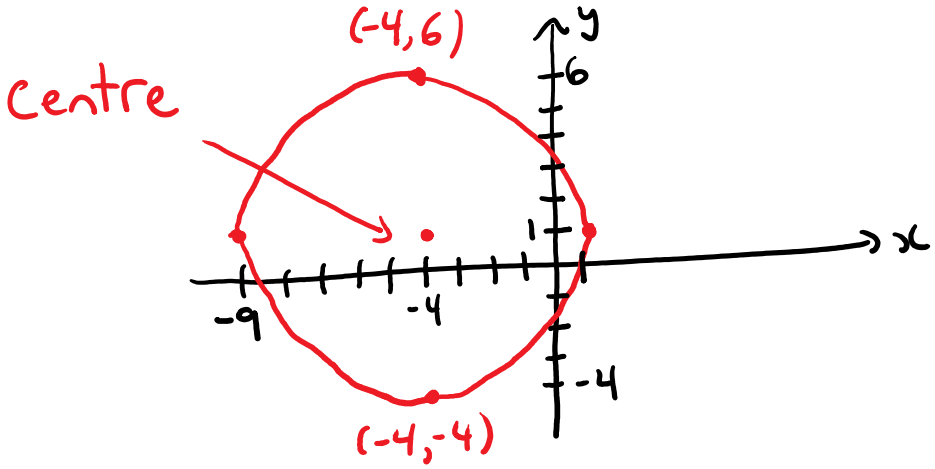
$$(x+1)^2 + (y-2)^2 = 27$$

Ex: Graph $3(x+4)^2 + 3(y-1)^2 = 75$

→ Standard Form

$$(x+4)^2 + (y-1)^2 = 5^2 \quad \leftarrow 25$$

Centre $= (-4, 1)$ Radius $= 5$



Ex: Find the x-intercepts (above)

set $y = 0$ in $(x+4)^2 + (y-1)^2 = 25$

$$(x+4)^2 + (-1)^2 = 25$$

$$(x+4)^2 + 1 = 25$$

$$(x+4)^2 = 24$$

$x+4 = \pm\sqrt{24}$

$\pm 2\sqrt{6}$

$x = -4 \pm 2\sqrt{6}$

As points: $(-4-2\sqrt{6}, 0)$

and $(-4+2\sqrt{6}, 0)$

Ex: Find standard form given

$$x^2+y^2-8x+6y-5=0$$

Complete the Square

$$x^2-8x + y^2+6y = 5$$

$\left(\frac{-8}{2}\right)^2=16$ $\left(\frac{6}{2}\right)^2=9$

Add 16 and 9

$$x^2-8x+16 + y^2+6y+9 = 5+16+9$$

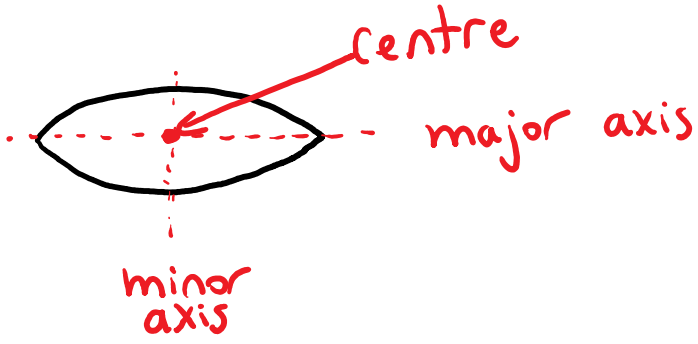
$$(x-4)^2 + (y+3)^2 = 30$$

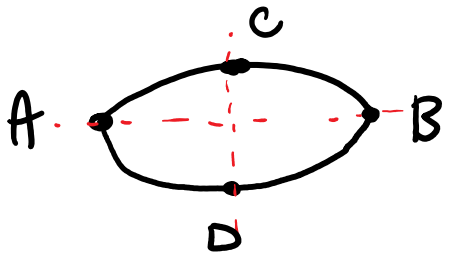
or $\sqrt{30}^2$

Centre $= (4, -3)$

$r = \sqrt{30}$

11.3 Ellipses





A, B : "vertices"

C, D : other points

Equation of Ellipse

$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$$

★ Know this

Centre = (h, k)

Ex: Consider $\frac{x^2}{9} + \frac{y^2}{16} = 1$

a) Centre?

$(0, 0)$

b) Find 4 points

$x = 0 \longrightarrow \frac{y^2}{16} = 1$

$y^2 = 16$

$y = \pm 4$

$(0, \pm 4)$

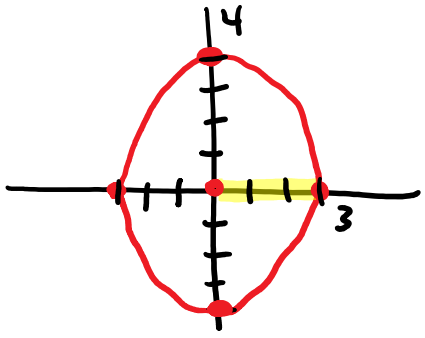
$y = 0 \rightarrow \frac{x^2}{9} = 1$

$\vdots$

$x = \pm 3$

$(\pm 3, 0)$

c) Graph



$$\frac{x^2}{9} + \frac{y^2}{16} = 1$$