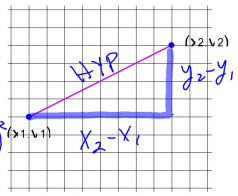
The distance form

The distance between the two po $_{1},y_{1})$ & $(\ _{2},y_{2})$ is found by using the following for

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$Hyp^2 = Leg^2 + Leg^2$$

$$Hyp = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$$



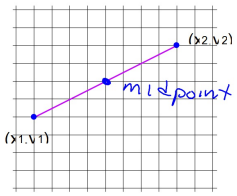
The distance formula is the actually the hypotenuse of a right triangle. Therefore, the distance formula is actually a variation of the Pythagorean Theorem.

Midpoint Form

The midpoint of a segment whose end $_{1},y_{1})$ an (x_2,y_2) is found using the following

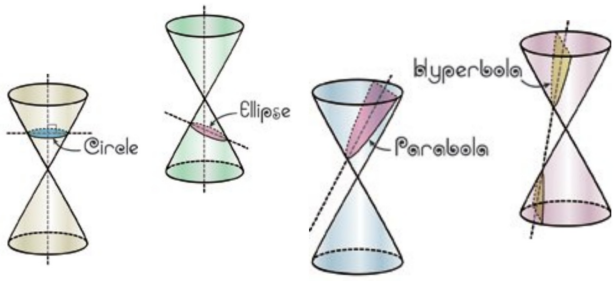
$$midpoint: \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

The midpoint is the point whose coordinates are the averages of the x and y coordinates of the endpoints.

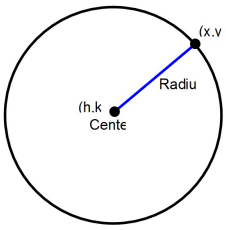


The four Conic Sect

- Circl
- Ellips
- Hyperbc
- Parabc



Use the distance formula to f
expression for the length of the



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

If you square both s

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

You ge

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

This is the equation of a circle whose cer
and whose radiu r.

Equation of a circle whose center is at
(h,k): and radiu

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

Equation of a circle whose center is at th
and radius

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

Find the equation of the circle that is a transl $^2 + ^2 = 36$
5 units right and 7 units d

center (5, -7)
h, k

$$(x-5)^2 + (y+7)^2 = 36$$

The circle $(x \cdot ^2 + (y + ; ^2 = 100$ was translated 4 uni
and 9 units up. Write the new equation of th

original center $(3, -2)$

4 left 9 up
3-4 -2+9

new center $(-1, 7)$

new eq $(x+1)^2 + (y-7)^2 = 100$

Given the equation of a circ $^2 + \ ^2 = 3$;
state the coordinates of the center and th

Center: $(0,0)$

Radius = $\sqrt{32} = 4\sqrt{2} < 5.66$

$r^2 = 32$

4 left 7 up

Given the equation of a circle is $(x+4)^2 + (y-7)^2 = 81$
state the coordinates of the center and the radius.

Center: $(-4,7)$

Ra $\sqrt{r^2} = \sqrt{81}$

$r = 9$

5 right 7 down

Given the equation of a circle is $(x-5)^2 + (y+7)^2 = 441$
State the coordinates of the center of the circle and find the length of the diameter.

Center: $(5,-7)$

Diameter = 42

$r^2 = 441$

$r = \sqrt{441} = 21$

$d = 2 \cdot r = 2(21)$

3 right

The equation of a circle is $(x-3)^2 + y^2 = 45$

State the coordinates of the center of the cir
find the length of the diam

Center: $(3,0)$

Diameter = $6\sqrt{5}$

$r = \sqrt{45} = 3\sqrt{5}$

$d = 2 \cdot r = 2(3\sqrt{5})$
$= 6\sqrt{5}$

The center of a circle is (-4,9) and the radius is 5
equation of this ci

$(x+4)^2 + (y-9)^2 = 25$

4 left 9 up $r^2 = (5)^2$

The center of a circle is (0,0) and the point (5,-8) is on the circle.
Write the equation of this circle.

$x^2 + y^2 = 89$

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

The radius is the distance from the center to any point on the circle.

$\sqrt{(5-0)^2 + (-8-0)^2}$

$\sqrt{25+64}$

$r = \sqrt{89} \longrightarrow r^2 = (\sqrt{89})^2$

$r^2 = 89$

The center of a circle is (21,9) and the point (16,-1) is on the circle.
Write the equation of the circle.

$(x-21)^2 + (y-9)^2 = 125$

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

The radius is the distance from the center to any point on the circle.

$\sqrt{(5)^2 + (10)^2}$

$r = \sqrt{125} \longrightarrow r^2 = 125$