

Lesson 91 Objective: SWBAT find equations of conic sections and identify their key features.

Kickoff

Identify each of the following conic sections:

- 1) $3x^2 - 5y^2 + 5x - 6y = 0$
- 2) $x^2 - 4x + 4y - 12 = 0$
- 3) $x^2 + 4y^2 - 7x + 16y - 22 = 0$

hyperbola
parabola
circle
ellipse

Apr 16-7:19 AM

1) Write the equation of a circle given the center and radius.

Center: (-8, 5) Radius: 4

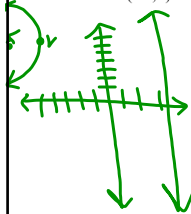
$$(x-h)^2 + (y-k)^2 = r^2$$

$$(x+8)^2 + (y-5)^2 = 16$$



2) Write the equation of a parabola in vertex form.

Vertex: (-5, 7) Directrix: x = 3



Left

$$(y-k)^2 = \pm 4p(x-h)$$

L/R $(y-7)^2 = -32(x+5)$

b/D $(x-h)^2 = \pm 4p(y-k)$

$$(y-7)^2 = -32(x+5)$$

4(8)

Apr 16-7:23 AM

3) Find the key features of the ellipse and sketch its graph. (center, coordinates of vertices, coordinates of foci)

Ellipse
horizontal
C (5, -3)
a = 4
b = 3

$$\frac{(x-5)^2}{16} + \frac{(y+3)^2}{9} = 1$$

Vertices
(1, -3) (9, -3)
(5, 0) (5, -6)

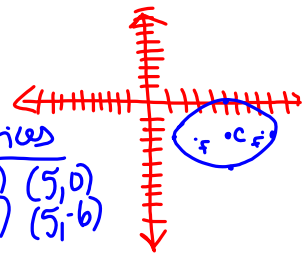
Foci
 $(5 \pm \sqrt{7}, -3)$

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

$$16 = 9 + c^2$$

$$7 = c^2$$

$$\pm\sqrt{7} = c$$



Apr 16-7:24 AM

4) Find the key features of the hyperbola and sketch its graph. (center, vertices, foci)

hyperbola
vertical
C (3, -2)

$$\frac{(y+2)^2}{25} - \frac{(x-3)^2}{49} = 1$$

a = 5
b = 7
Vertices (3, 3) (3, -7)

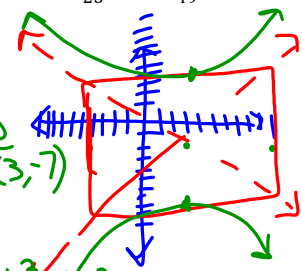
Foci

$$(3, -2 \pm \sqrt{74})$$

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

$$25 + 49 = c^2$$

$$\sqrt{74} = c$$



Apr 16-7:24 AM