... Then find the center, radius, vertices, foci, and sketch its graph. (Center and radius only if it's a circle.)

Ellipse

6.) $9x^2 + 4y^2 + 36x - 24y + 36 = 0$

$9(x^2+4x+4) + 4(y^2-6y+9) = -36+36+36$

$9(x+2)^2 + 4(y-3)^2 = 36$

$\frac{(x+2)^2}{4} + \frac{(y-3)^2}{9} = 1$

Center $(-2, 3)$

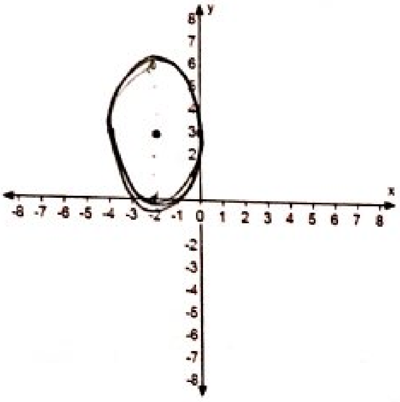
Vertices: $(-2, 6), (-2, 0)$

Co-Vertices: $(0, 3) (-4, 3)$

Foci: $(-2, 3 \pm \sqrt{5})$

$c^2 = 9 - 4 = 5$

$c = \sqrt{5}$



Circle

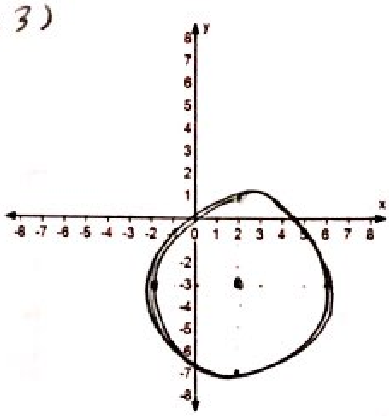
7.) $x^2 + y^2 - 4x + 6y - 3 = 0$

$(x^2-4x+4) + (y^2+6y+9) = 3+13$

$(x-2)^2 + (y+3)^2 = 16$

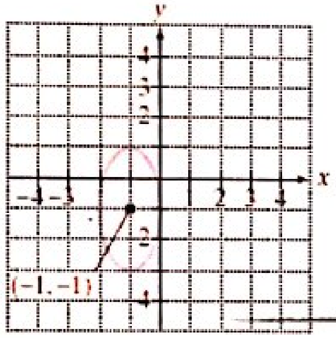
Center $(2, -3)$

$r = 4$



Find the standard form of the equation of the ellipse with the given characteristics.

8.)



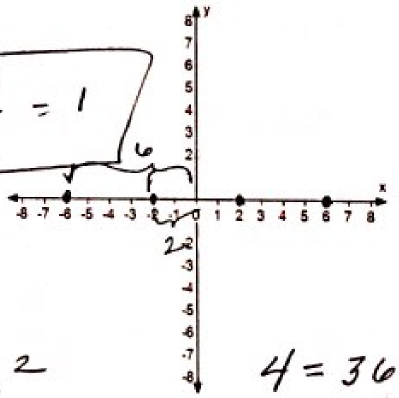
$$\boxed{\frac{(x+1)^2}{1} + \frac{(y+1)^2}{4} = 1}$$

9.) Vertices $(\pm 6, 0)$; Foci: $(\pm 2, 0)$

$a = 6$

$c = 2$

$$\boxed{\frac{x^2}{36} + \frac{y^2}{32} = 1}$$

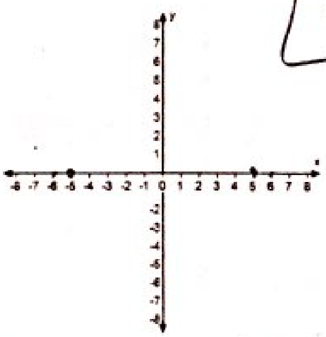


$c^2 = a^2 - b^2$

$4 = 36 - b^2$

10.) Foci $(\pm 5, 0)$; Major Axis Length is 12

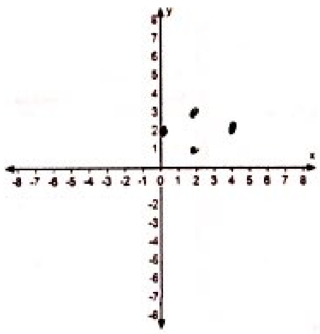
$$\boxed{\frac{x^2}{36} + \frac{y^2}{11} = 1}$$



$25 = 36 - b^2$

11.) Vertices $(0, 2)$ and $(4, 2)$; endpoints of the minor axis are $(2, 3)$ and $(2, 1)$

Center: $(2, 2)$



$$\boxed{\frac{(x-2)^2}{4} + \frac{(y-2)^2}{1} = 1}$$

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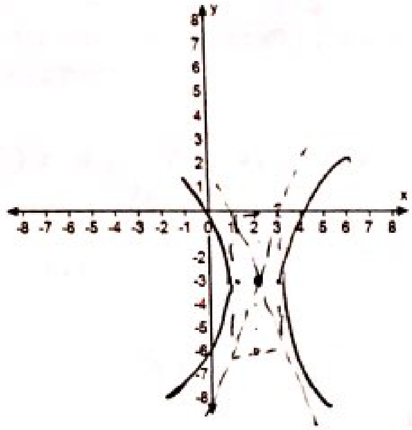
sketch its graph.

12.) $9x^2 - y^2 - 36x - 6y + 18 = 0$

$9(x^2 - 4x + 4) - (y^2 + 6y + 9) = -18 + 36 - 9$

$9(x-2)^2 - (y+3)^2 = 9$

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



Center: $(2, -3)$

Lines containing axes

$x = 2$ $\quad$ $y = -3$

conjugate $\quad$ Transverse

Vertices: $(1, -3), (3, -3)$

Foci: $(2 \pm \sqrt{10}, -3)$

$c = \sqrt{10}$

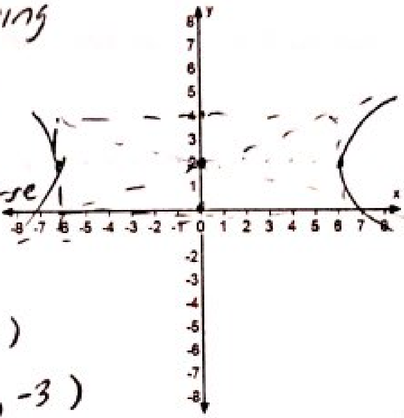
Asymptotes: $y = -3 \pm 3(x-2)$

13.) $x^2 - 9y^2 + 36y - 72 = 0$

$x^2 - 9(y^2 - 4y + 4) = 72 - 36$

$x^2 - 9(y-2)^2 = 36$

$\frac{x^2}{36} - \frac{(y-2)^2}{4} = 1$



Center: $(0, 2)$

Lines containing axes

$x = 0$ conjuga

$y = 2$ transve

Vertices: $(6, 2), (-6, 2)$

Foci: $(\pm 2\sqrt{10}, 2$

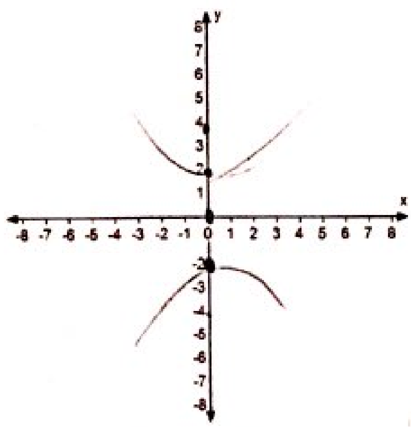
$c = 2\sqrt{10}$

Asymptotes: $y = 2 \pm \frac{1}{3}x$

Find the standard form of the equations of the hyperbola with the given characteristics and center at the origin.

14.) Vertices $(0, \pm 2)$; Foci: $(0, \pm 4)$

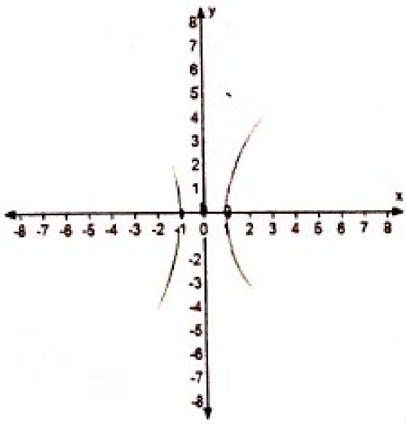
$$\boxed{\frac{y^2}{4} - \frac{x^2}{12} = 1}$$



$c^2 = a^2 + b^2 \quad 16 = 4 + b^2$

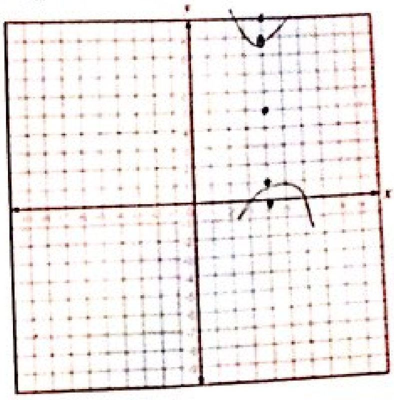
15.) Vertices $(\pm 1, 0)$; Asymptotes: $y = \pm 5x$ $\frac{}{1}$

$$\boxed{\frac{x^2}{1} - \frac{y^2}{25} = 1}$$



Find the standard form of the equations of the hyperbola with the given characteristics.

16.) Vertices $(4,1)$ and $(4,9)$; Foci $(4,0)$ and $(4,10)$



$$\frac{(y-5)^2}{16} - \frac{(x-4)^2}{9} = 1$$

$$25 = 16 + b^2$$

Write the equation in standard form and then classify the graph as a parabola, circle, ellipse, or hyperbola.

C

17.) $x^2 + y^2 - 6x + 4y + 9 = 0$

$$(x^2-6x+9)+(y^2+4y+4) = -9+9+4$$

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

E

18.) $x^2 + 4y^2 - 6x + 16y + 21 = 0$

$$(x^2-6x+9) + 4(y^2+4y+4) = -21+9+16$$

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

$$\frac{(x-3)^2}{4} + (y+2)^2 = 1$$

H

19.) $4x^2 - y^2 - 4x - 3 = 0$

$$4(x^2 - x + \tfrac{1}{4}) - y^2 = 3+1$$

$$4(x-\tfrac{1}{2})^2 - y^2 = 4$$

$$(x-\tfrac{1}{2})^2 - \frac{y^2}{4} = 1$$

P

20.) $y^2 - 6y - 4x + 21 = 0$

$$y^2 - 6y + 9 = 4x - 21 + 9$$

$$(y-3)^2 = 4x - 12$$

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

PreCalculus
WS: Chapter 9 Review

Name Key
Date 3/15, 3/16 **Block** 2B, 1A

Find the vertex, focus, and directrix of the parabola and sketch its graph. $p=1$

1.) $y^2+6y+8x+25=0$ $p=-2$

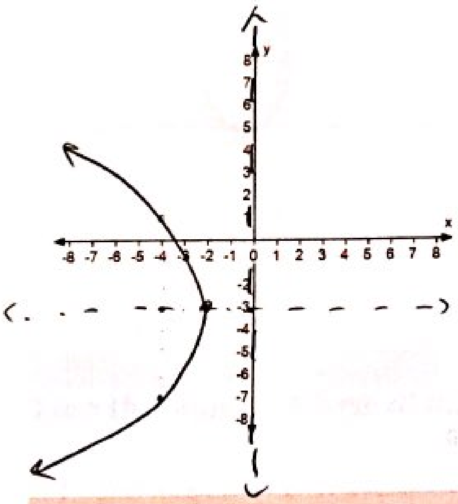
$(y^2+6y+9)=-8x-25+9$
$(y+3)^2=-8x-16$
$(y+3)^2=-8(x+2)$

Vertex: $(-2,-3)$

Focus: $(-4,-3)$

Directrix: $x=0$

A.O.S. $y=-3$



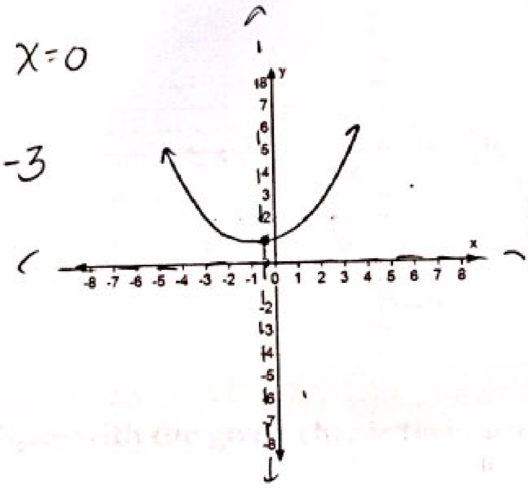
2.) $\left(x+\frac{1}{2}\right)^2=4(y-1)$

Vertex $(-1/2, 1)$

Focus: $(-1/2, 2)$

directrix: $y=0$

A.O.S. $x=-1/2$

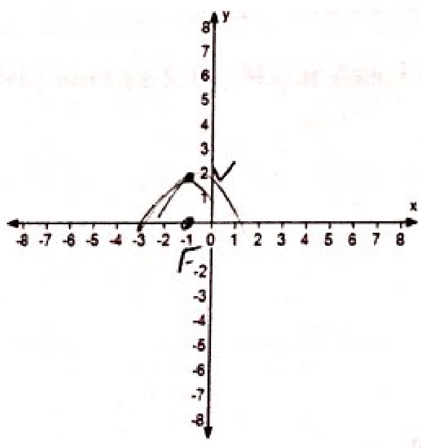


Find the standard form of the equation of the parabola with the given characteristics.

3.) Vertex: (-1, 2); Focus (-1, 0)

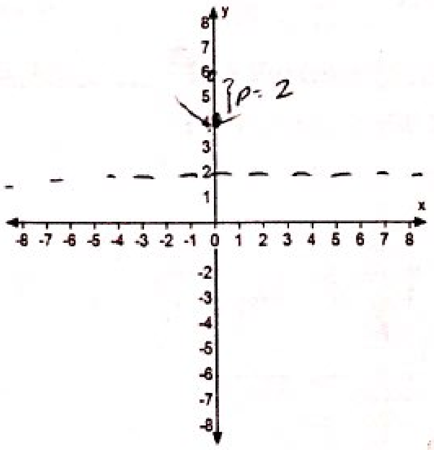
$\boxed{(x+1)^2=-8(y-2)}$

$p=-2$



4.) Vertex: (0, 4); Directrix: $y=2$

$x^2=8(y-4)$

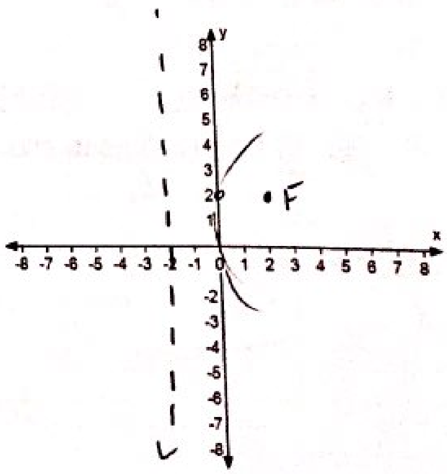


5.) Focus: (2, 2); Directrix: $x=-2$

$(y-2)^2=8x$

Vertex $(0,2)$

$p=2$



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