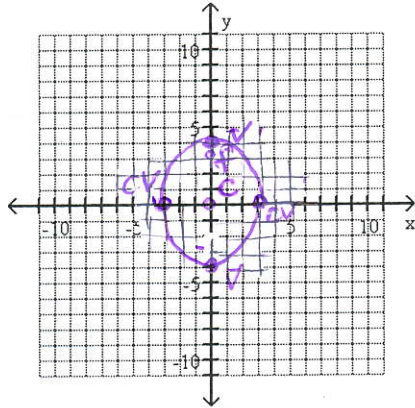


Name Key

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Graph the ellipse and label all of the important pieces.

1) $16x^2 + 9y^2 = 144$



$$\frac{16x^2}{144} + \frac{9y^2}{144} = 1$$

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

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

$$16 - 9 = c^2$$

$$7 = c^2$$

$$\sqrt{7} = c$$

1) ←

Convert the equation to the standard form for a hyperbola by completing the square on x and y.

2) $4x^2 - 16y^2 + 16x - 64y - 112 = 0$

$$4x^2 + 16x - 16y^2 - 64y - 112 = 0$$

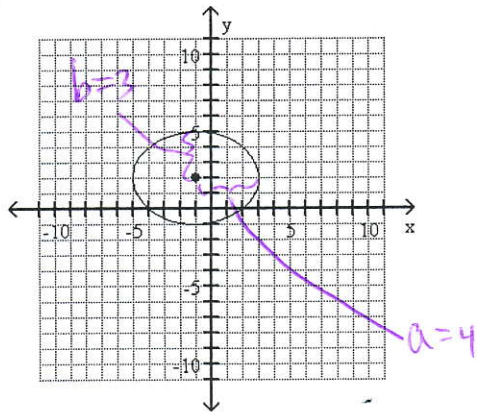
$$4(x^2 + 4x + 4) - 16(y^2 + 4y + 4) - 112 - 16 + 64 = 0$$

$$4(x+2)^2 - 16(y+2)^2 = 64$$

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

Find the standard form of the equation of the ellipse and give the location of its foci.

3)



Center at (-1, 2)

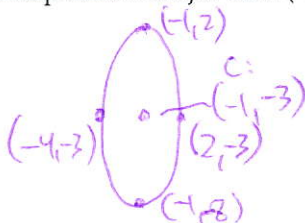
$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$$

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

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

Find the standard form of the equation of the ellipse satisfying the given conditions.

4) Endpoints of major axis: (-1, -8) and (-1, 2); endpoints of minor axis: (-4, -3) and (2, -3);



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

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

4) $\frac{(x+1)^2}{9} + \frac{(y+3)^2}{25} = 1$

5) Major axis horizontal with length 18; length of minor axis = 10; center (0, 0)

$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1 \quad \frac{x^2}{9^2} + \frac{y^2}{5^2} = 1$$

5) $\frac{x^2}{81} + \frac{y^2}{25} = 1$

6) Foci: (-6, 0), (6, 0); x-intercepts: -8 and 8

$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1 \quad \frac{x^2}{8^2} + \frac{y^2}{b^2} = 1$$

$c=6$
 $a^2 - b^2 = c^2 \rightarrow 8^2 - b^2 = 6^2$
 $-b^2 = 36 - 64$
 $b^2 = 28$

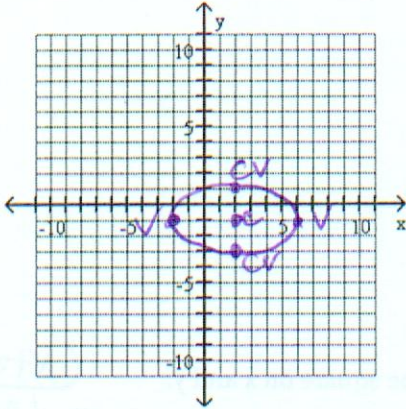
6) $\frac{x^2}{64} + \frac{y^2}{28} = 1$

Graph the ellipse. Label all of the important pieces.

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

$c = (2, -1)$

7) \leftarrow



Find the standard form of the equation of the hyperbola satisfying the given conditions.

8) Endpoints of transverse axis: (0, -8), (0, 8); asymptote: $y = \frac{4}{9}x$

$$\frac{(y-h)^2}{a^2} - \frac{(x-k)^2}{b^2} = 1 \quad \frac{y^2}{8^2} - \frac{x^2}{b^2} = 1$$

$\frac{4}{9} = \frac{8}{b}$
 $b = 18$

8) $\frac{y^2}{64} - \frac{x^2}{324} = 1$

9) Foci: (-10, 0), (10, 0); vertices: (-6, 0), (6, 0)

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

$6^2 + b^2 = 10^2$
 $b^2 = 100 - 36$
 $b^2 = 64$

9) $\frac{x^2}{36} - \frac{y^2}{64} = 1$

10) Center: (4, 6); Focus: (1, 6); Vertex: (3, 6)

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

$1^2 + b^2 = 3^2$
 $b^2 = 9 - 1$
 $b^2 = 8$

10) $\frac{(x-4)^2}{1} - \frac{(y-6)^2}{8} = 1$

Convert the equation to the standard form for a hyperbola by completing the square on x and y.

11) $y^2 - 4x^2 - 4y + 8x - 4 = 0$

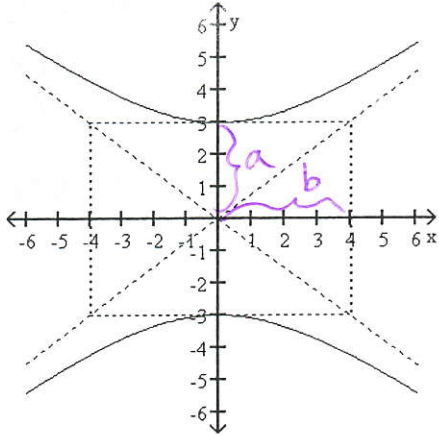
$$y^2 - 4y + 4 - 4x^2 + 8x - 4 = 0$$

$$(y-2)^2 - 4(x-1)^2 = 4$$

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

Find the standard form of the equation of the hyperbola.

12)



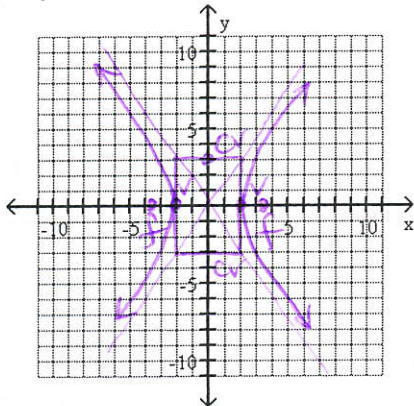
$$\frac{(y-k)^2}{a^2} - \frac{(x-h)^2}{b^2} = 1$$

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

12) $\frac{y^2}{9} - \frac{x^2}{16} = 1$

Find center, vertices, covertices, foci and asymptotes and graph the hyperbola.

13) $9x^2 - 4y^2 = 36$



$$\frac{x^2}{4} - \frac{y^2}{9} = 1$$

$$\frac{a^2}{4} \quad \frac{b^2}{9}$$

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

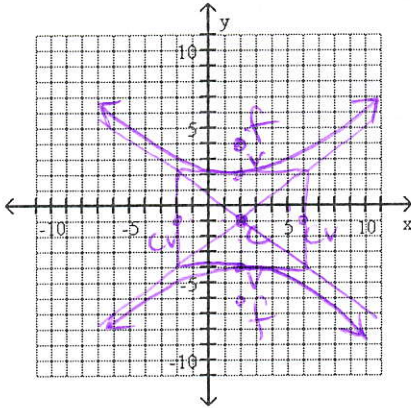
$$4 + 9 = c^2$$

$$13 = c^2$$

13) $C: (0,0)$
 $V: (\pm 2, 0)$
 $CV: (0, \pm 3)$
 $F: (\pm \sqrt{13}, 0)$
 $asymp: y = \pm \frac{3}{2}x$

Find the center, vertices, covertices, foci and asymptotes to graph the hyperbola.

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



C:

$a^2 + b^2 = c^2$
 $9 + 16 = c^2$
 $5 = c$

14) C: (2, -1)
V: (2, 2), (2, -4)
cv: (6, -1), (-2, -1)
f: (2, 4), (2, -6)

Convert the equation to the standard form for a parabola by completing the square on x or y as appropriate.

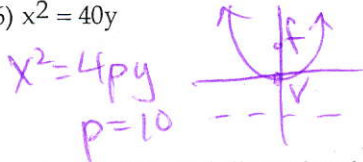
15) $x^2 - 4x + 3y - 5 = 0$

$x^2 - 4x + 4 - 4 + 3y - 5 = 0$
 $(x-2)^2 = -3y + 9$

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

Find the focus and directrix of the parabola with the given equation.

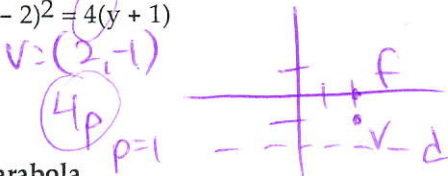
16) $x^2 = 40y$



16) f: (0, 10)
d: y = -10

Find the vertex, focus, and directrix of the parabola with the given equation.

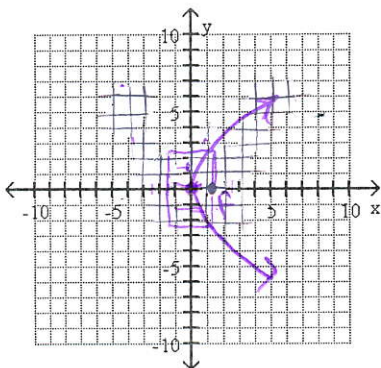
17) $(x-2)^2 = 4(y+1)$



17) v: (2, -1)
f: (2, 0)
d: y = -2

Graph the parabola.

18) $y^2 = 5x$

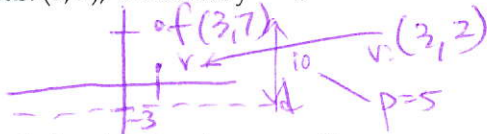


$y^2 = 5x$
 $4px$
 $p = \frac{5}{4}$

18) ←

Find the standard form of the equation of the parabola using the information given.

19) Focus: (3, 7); Directrix: $y = -3$



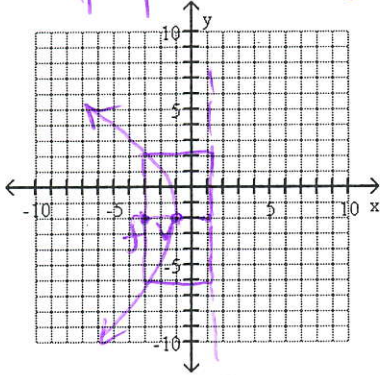
$$(x-3)^2 = 4(5)(y-7)$$

19) $(x-3)^2 = 20(y-7)$

Graph the parabola with the given equation.

20) $(y+2)^2 = -8(x+1)$

$4p \quad p = -2 \quad \curvearrowright \quad v: (-1, -2)$



20) ←

Identify the equation without completing the square.

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

21) parabola

22) $2x^2 + 4y^2 + 8x + 4y = 0$

$A \cdot C > 0$

22) ellipse

23) $4x^2 - 4y^2 + 5x + 4y + 3 = 0$

$A \cdot C < 0$

23) hyperbola

24) $5x^2 - 6y^2 + 2x - 3y - 5 = 0$

$A \cdot C < 0$

24) hyperbola

25) $2y^2 - 3x + 2y = 0$

25) parabola