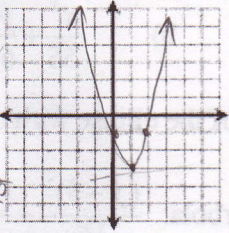


Write an equation of the conic section.

- Circle with center at (-3, 1) and radius 2 $(x+3)^2 + (y-1)^2 = 4$
- Ellipse with vertices at (-5, 1) and (-1, 1) and co-vertices at (-3, 2) and (-3, 0) $\frac{(x+3)^2}{4} + \frac{(y-1)^2}{1} = 1$
- Hyperbola with vertices at (8, -4) and (8, 4) and foci at (8, -6) and (8, 6) $\frac{y^2}{16} - \frac{(x-8)^2}{20} = 1$
 $c^2 = a^2 + b^2$
 $36 = a^2 + 16$ $a^2 = 20$

Graph the equation. Identify the important characteristics of the graph, such as center, radius, vertices, co-vertices, foci, and asymptotes (in point-slope form).

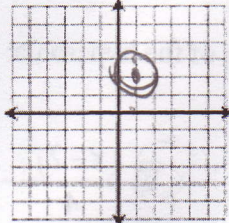
4. $y = 2(x-1)^2 - 3$



~~vertex~~
 vertex: (1, -3)
 foci: (1, -25/8)
 directrix: $y = -25/8$

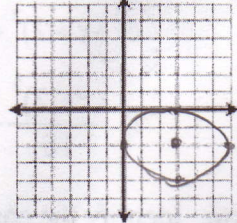
$p = \frac{1}{4p} = 2 \cdot p$

5. $(x-1)^2 + (y-2)^2 = 1$



radius: 1
 center: (1, 2)

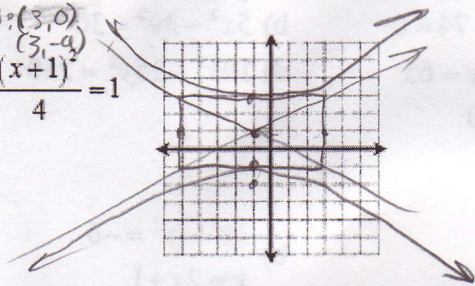
6. $\frac{(x-3)^2}{9} + \frac{(y+2)^2}{4} = 1$



center: (3, -2)
 foci: $(3 \pm \sqrt{5}, -2)$
 vertices: (0, -2), (6, -2)
 co-vertices: (3, 0), (3, -4)

$c^2 = a^2 - b^2$
 $c^2 = 9 - 4$
 $c^2 = 5$

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



center: (-1, 1)
 vertices: (-1, 3), (-1, -1)
 asymptotes: $y = 2x + 3$, $y = -2x - 1$
 foci: ()

$y = 2(-1) + b$
 $b = 3$
 $c^2 = a^2 + b^2$
 $c^2 = 16 + 9$
 $c^2 = 25$

Classify the conic section.

- $4x^2 - 4y^2 - 2x - 4y - 5 = 0$ hyperbola
- $3y^2 + 2x + 3y - 1 = 0$ parabola
- $x^2 - 2x + 3y - 5 = 0$ parabola
- $x^2 + 3y^2 - x + 2y - 4 = 0$ ellipse
- $3x^2 + 3y^2 + 3x + 3y - 1 = 0$ circle
- $5x^2 - 3y^2 + 2x + 3y - 4 = 0$ hyperbola

$3x^2 + 3x + 3y^2 + 3y = 1$
 $3(x^2 + x) + 3(y^2 + y) = 1$
 $3(x^2 + x + 0.25) + 3(y^2 + y + 0.25) = 1$
 $3(x + 0.5)^2 + 3(y + 0.5)^2 = 1$

11) $x^2 - x + 3y^2 + 2y = 4$
 $(x - 0.5)^2 + 3(y + \frac{1}{3})^2 = 4 + \frac{1}{4} + \frac{1}{3}$
 $(x - \frac{1}{2})^2 + 3(y + \frac{1}{3})^2 = \frac{9}{2}$

etc