NAME _____ DATE _____ PERIOD _____

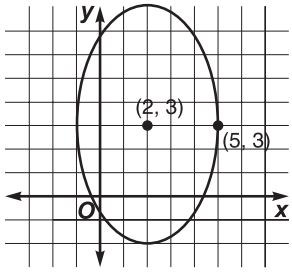
10-3

Practice

Ellipses

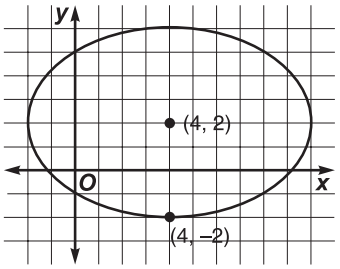
Write the equation of each ellipse in standard form. Then find the coordinates of its foci.

1.



$\frac{(y-3)^2}{25} + \frac{(x-2)^2}{9} = 1$;
$(2, -1), (2, 7)$

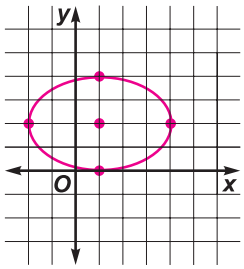
2.



$\frac{(x-4)^2}{36} + \frac{(y-2)^2}{16} = 1$;
$(4 - 2\sqrt{5}, 2), (4 + 2\sqrt{5}, 2)$

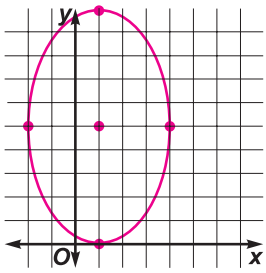
For the equation of each ellipse, find the coordinates of the center, foci, and vertices. Then graph the equation.

3. $4x^2 + 9y^2 - 8x - 36y + 4 = 0$



center: (1, 2);
foci: $(1 \pm \sqrt{5}, 2)$
vertices:
$(-2, 2), (1, 4),$
$(4, 2), (1, 0)$

4. $25x^2 + 9y^2 - 50x - 90y + 25 = 0$



center: (1, 5);
foci: (1, 9),
(1, 1)
vertices:
(1, 10), (1, 0),
(4, 5), (−2, 5)

Write the equation of the ellipse that meets each set of conditions.

5. The center is at (1, 3), the major axis is parallel to the y-axis, and one vertex is at (1, 8), and $b = 3$.

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

6. The foci are at $(-2, 1)$ and $(-2, -7)$, and $a = 5$.

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

7. ***Construction*** A semi elliptical arch is used to design a headboard for a bed frame. The headboard will have a height of 2 feet at the center and a width of 5 feet at the base. Where should the craftsman place the foci in order to sketch the arch?

1.5 ft from the center