

Ellipses Practice

Identify the center, vertices, and foci of each ellipse.

1. $\frac{x^2}{49} + \frac{y^2}{50} = 1$ tall $a^2 = 50$ $a = \pm 5\sqrt{2}$
 $50 - 49 = c^2$ $c = \pm 1$

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

2. $\frac{x^2}{36} + \frac{y^2}{27} = 1$ wide $a^2 = 36$ $a = \pm 6$
 $36 - 27 = c^2$ $c = \pm 3$

center: (0,0)
 vertices: (-6,0) (6,0)
 foci: (-3,0) (3,0)

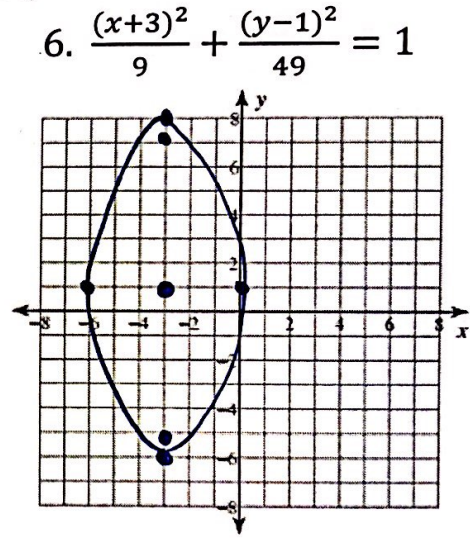
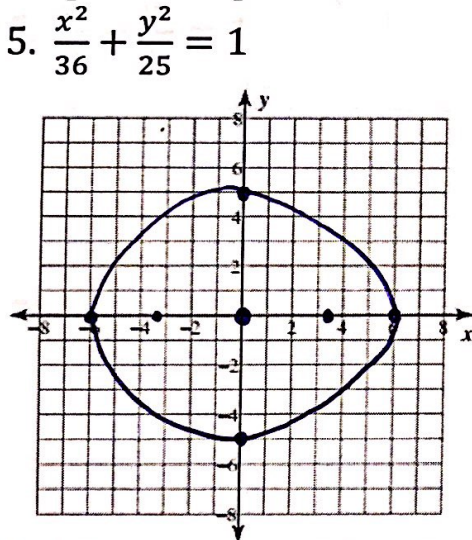
3. $\frac{(x-3)^2}{9} + \frac{(y+7)^2}{40} = 1$ tall $a^2 = 40$ $a = \pm 2\sqrt{10}$
 $40 - 9 = c^2$ $c = \pm \sqrt{31}$

center: (3,-7)
 vertices: (3, $-7 + 2\sqrt{10}$) (3, $-7 - 2\sqrt{10}$)
 foci: (3, $-7 + \sqrt{31}$) (3, $-7 - \sqrt{31}$)

4. $\frac{(x+2)^2}{5} + \frac{(y-1)^2}{10} = 1$ tall $a^2 = 10$
 $10 - 5 = c^2$ $a = \pm \sqrt{10}$

center: (-2,1)
 vertices: (-2, $1 + \sqrt{10}$) (-2, $1 - \sqrt{10}$)
 foci: (-2, $1 + \sqrt{5}$) (-2, $1 - \sqrt{5}$)

Graph Each Equation. Include the center, vertices, and foci.



Find the equation of the ellipse with the given information.

7. Vertices at (-2, 3) and (8, 3) and Foci at (0, 3) and (6, 3)

center (3,3) $a = 5$ $c = 3$

$\frac{(x-3)^2}{25} + \frac{(y-3)^2}{16} = 1$

Wide $25 - b^2 = 9$

8. Endpoints of the ellipse at (-5, -4), (-5, 10), (-11, 3), and (1, 3)

center (-5, 3) $a = 7$ $b = 6$

$\frac{(x+5)^2}{36} + \frac{(y-3)^2}{49} = 1$

Complete the square to find the equation of the ellipse.

9. $2x^2 + y^2 + 8x - 16y + 52 = 0$

$2(x^2 + 4x + 4) + (y^2 - 16y + 64) = -52$
 $2(x+2)^2 + (y-8)^2 = -20$
 $\frac{(x+2)^2}{10} + \frac{(y-8)^2}{20} = 1$

10. $169x^2 + 4y^2 - 338x + 32y - 443 = 0$

$169(x^2 - 2x + 1) + 4(y^2 + 8y + 16) = 443$
 $169(x-1)^2 + 4(y+4)^2 = 676$
 $\frac{(x-1)^2}{4} + \frac{(y+4)^2}{169} = 1$