

Ellipses, Continued

Standard form of an ellipse:

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

Center is always (h, k) and $a > b$.

Example #1:

Graph. Identify the center, vertices, co-vertices, foci, domain, and range of the ellipse.

$$\frac{(x-1)^2}{225} + \frac{(y+5)^2}{324} = 1$$

$b = 15$ $a = 18$

center: $(1, -5)$

vertices: $(1, 13), (1, -23)$

co-vertices: $(16, -5), (-14, -5)$

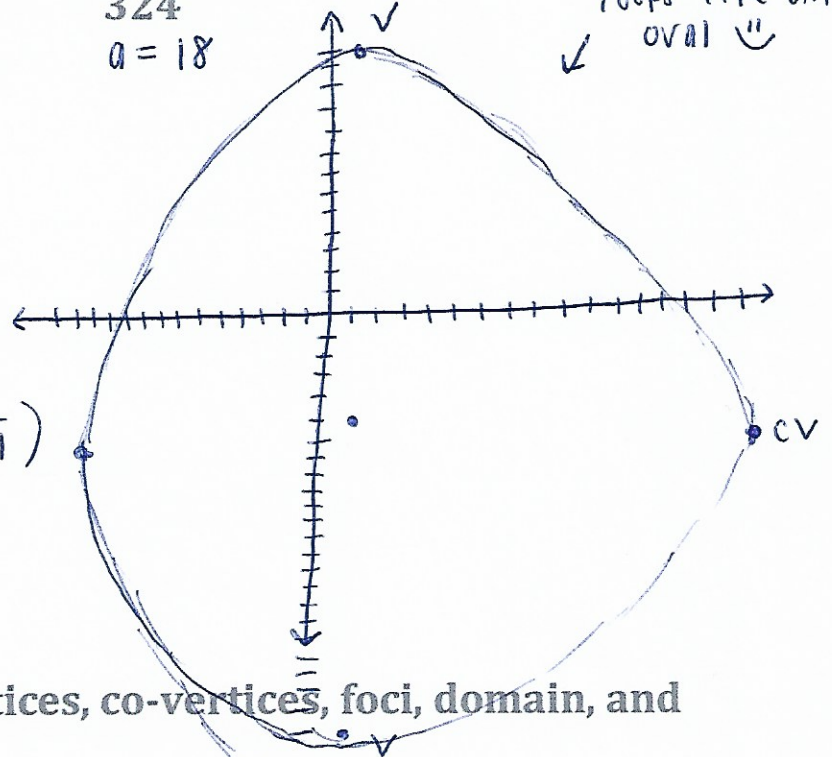
$$c = \sqrt{324 - 225} = \sqrt{99} = 3\sqrt{11}$$

*c gets add to same coordinate as we traveled for vertices

foci: $(1, -5 + 3\sqrt{11}), (1, -5 - 3\sqrt{11})$

D: $[-14, 16]$

R: $[-23, 13]$



You try: Find the center, vertices, co-vertices, foci, domain, and range of the ellipse.

$$\frac{(x+3)^2}{81} + \frac{(y-4)^2}{64} = 1$$