

1. Determine the center and radius of the circle with equation
 $x^2 + y^2 - 2x + 2y - 14 = 0$

$$(x-1)^2 + (y+1)^2 = 16$$

$$\text{center} = (1, -1)$$

$$\text{radius} = 4$$

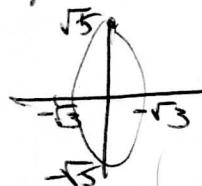
2. Determine the major vertices of ellipse whose equation is
 $5x^2 + 3y^2 = 15$

$$\frac{5x^2}{15} + \frac{3y^2}{15} = \frac{15}{15}$$

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

↑
major axis

put in
standard
form



$$(0, \sqrt{5})(0, -\sqrt{5})$$

3. Find the product and write in standard form.

$$\left[\frac{18}{5}(\cos 55^\circ + i \sin 55^\circ) \right] \cdot \left[\frac{20}{3}(\cos 95^\circ + i \sin 95^\circ) \right]$$

$$\begin{aligned} & \frac{18}{5} \cdot \frac{20}{3} (\cos 55^\circ + i \sin 55^\circ) \\ & \quad \cos 150^\circ + i \sin 150^\circ \\ & 24 \left(-\frac{\sqrt{3}}{2} + i \frac{1}{2} \right) \\ & = -12\sqrt{3} + 12i \end{aligned}$$

4. Write the complex number in standard form.

$$8 \left(\cos \frac{7\pi}{4} + i \sin \frac{7\pi}{4} \right)$$

$$8 \left(\cos 315^\circ + i \sin 315^\circ \right)$$

$$8 \left(\frac{\sqrt{2}}{2} + i \sin -\frac{\sqrt{2}}{2} \right)$$

$$4\sqrt{2} + -4\sqrt{2}i \quad 4\sqrt{2} - 4\sqrt{2}i$$

5. Eliminate the parameter.

$$\begin{cases} x = \sqrt{t+3} \\ y = t^2 - 6 \end{cases}$$

$$x = \sqrt{t+3} \Rightarrow x^2 = t+3 \quad t = x^2 - 3$$

$$\begin{aligned} y &= (x^2 - 3)^2 - 6 = \\ & (x^2 - 3)(x^2 - 3) - 6 = y = x^4 - 6x^2 + 3 \end{aligned}$$

6. Find a set of parametric equations.

$$x = t + 5$$

$$y = (x-5)^2$$

$$y = (t+5-5)^2$$

$$y = t^2 \quad \begin{cases} y = t^2 \\ x = t + 5 \end{cases}$$

7. Find the component form and the magnitude of the vector v.

Initial point: (-1, 5)
 Terminal point: (15, 2)

Component form

$$(15-5, 2-5) = \langle 10, -3 \rangle$$

$$\sqrt{10^2 + (-3)^2} = \sqrt{109}$$

$$\text{magnitude is } \sqrt{109}$$

8. Find the direction angle of the vector.

$$\mathbf{u} = 2\mathbf{i} - \mathbf{j}$$



$$\tan = \frac{-1}{2}$$

$$\tan^{-1} \left(\frac{1}{2} \right) = -27^\circ$$

$$360^\circ - 27^\circ = 333^\circ$$

$$= 333^\circ$$

9. Find the component form of v where $\mathbf{u} = 4\mathbf{i} - 2\mathbf{j}$ and $\mathbf{w} = \mathbf{i} - \mathbf{j}$.

$$\mathbf{v} = 2\mathbf{u} - \mathbf{w}$$

$$2(4\mathbf{i} - 2\mathbf{j}) = \langle 8, -4 \rangle$$

$$\langle 8, -4 \rangle - \langle 1, -1 \rangle$$

$$\langle 7, -3 \rangle = \langle 7, -3 \rangle$$

10. Find the distance between two points.

$$(1, 1, -7), (-2, -3, -7)$$

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$$

$$\sqrt{(-2-1)^2 + (-3-1)^2 + (-7-7)^2}$$

$$\sqrt{3^2 + 4^2 + 0^2}$$

$$\sqrt{9+16} = \sqrt{25} = 5$$