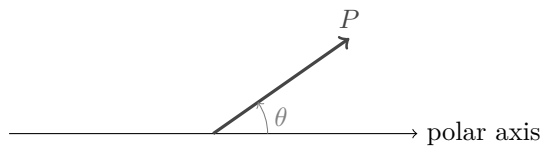
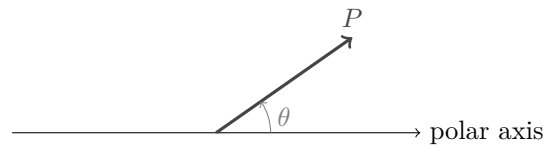


Question 4**Problem**

Determine all intersections of $r = 2$ and $r = 4 \cos \theta$.



Question 4 – Solution**Solution**

1. Use the polar–Cartesian relationships

$$x = r \cos \theta, \quad y = r \sin \theta, \quad r^2 = x^2 + y^2.$$

Equivalent polar coordinates satisfy

$$(r, \theta) = (r, \theta + 2k\pi) = (-r, \theta + (2k + 1)\pi).$$

2. Apply the identity that matches the requested conversion, symmetry test, or intersection, and then check the resulting point or curve in the original polar equation.
3. $2 = 4 \cos \theta$ gives $\theta = \pm\pi/3$.
4. The points are $(1, \pm\sqrt{3})$.