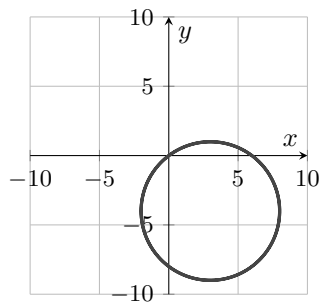
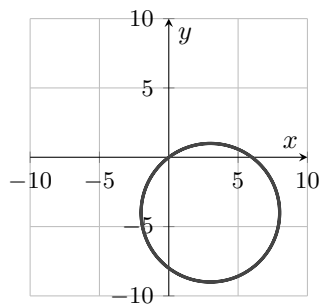


Question 2**Problem**

Convert $r = 6 \cos \theta - 8 \sin \theta$ to Cartesian form and identify the curve.



Question 2 – 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. $r^2 = 6x - 8y$, so $(x - 3)^2 + (y + 4)^2 = 25$: a circle centered at $(3, -4)$ with radius 5.