

## Double Integrals

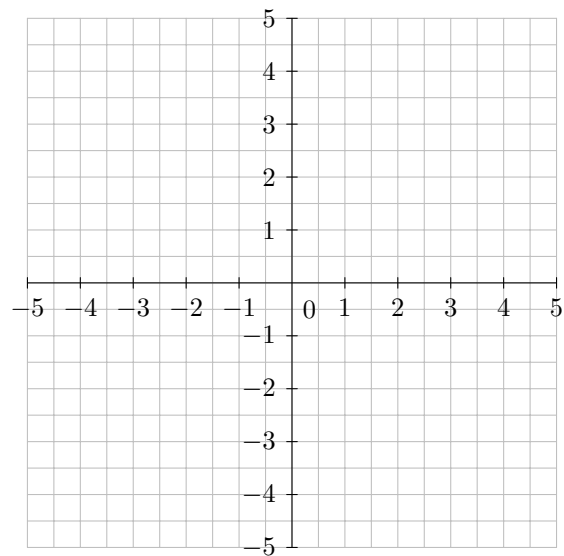
1. Find the area between the curves  $y = x^2$  and  $x = y^2$ .

2. Find the area between the curves  $x + 2y = 1$  and  $x = y^2 - 2$ .

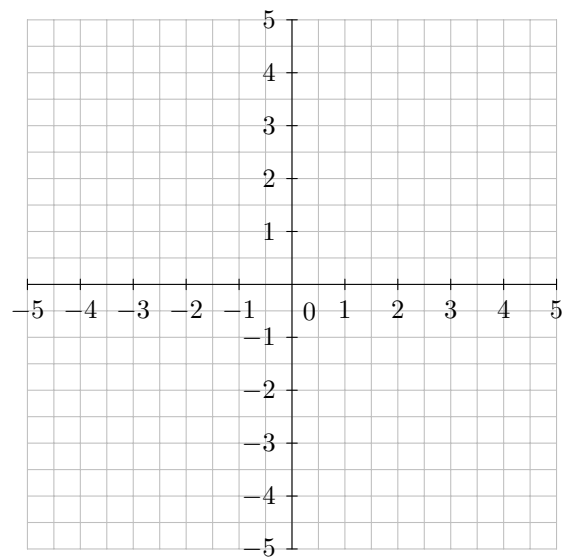
3. Given the equations below,

- Draw a picture of the curve formed by the equation.
- Write down an integral in rectangular coordinates that would give the area inside the curve.
- Convert the equation to polar coordinates.
- Write down an integral in polar coordinates that would give the area inside the curve.

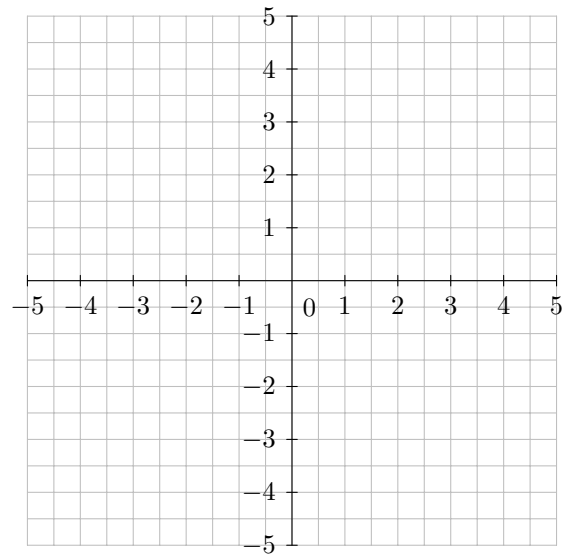
(a)  $x^2 + y^2 = 4$



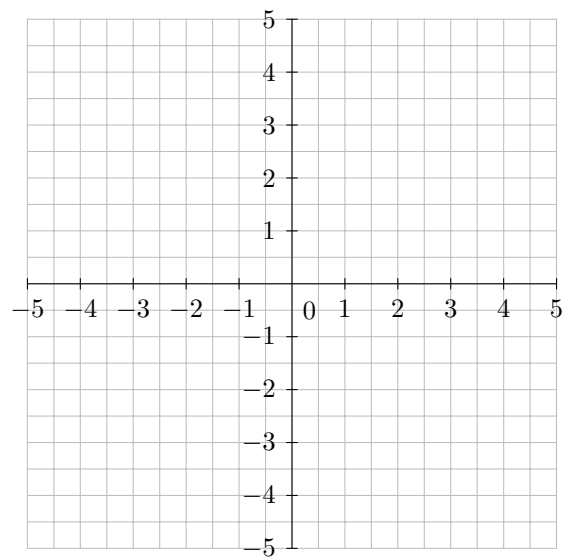
(b)  $(x - 1)^2 + y^2 = 1$



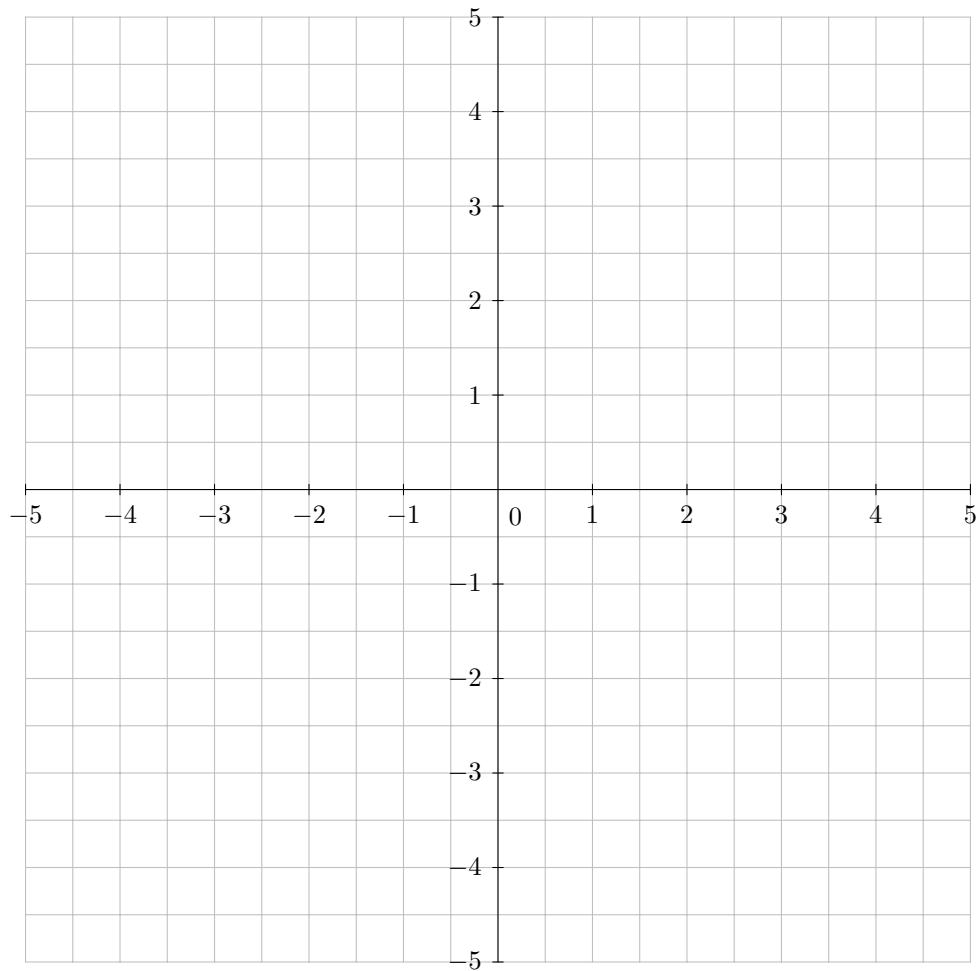
(c)  $9x^2 + 4y^2 = 36$



(d)  $x^2 + (y - 2)^2 = 4$



4. Draw a picture of the graphs of the following  $r = 2 \cos \theta$  and  $r = 1$  on the axes below. Write down the points  $(x, y)$  where the graphs intersect.



Find the area inside both curves.