# Problem 1.

Without using a calculator, sketch the graphs of the conics in parts (a), (b) and $c$.

(a) $3x^2 + 2y^2 = 6$

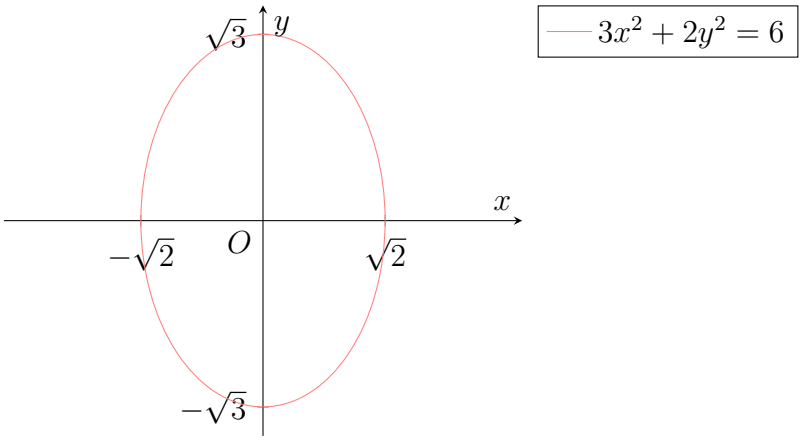
(b) $x^2 + y^2 + 4x - 2y - 20 = 0$

(c) $4(y-1)^2 - x^2 = 4$

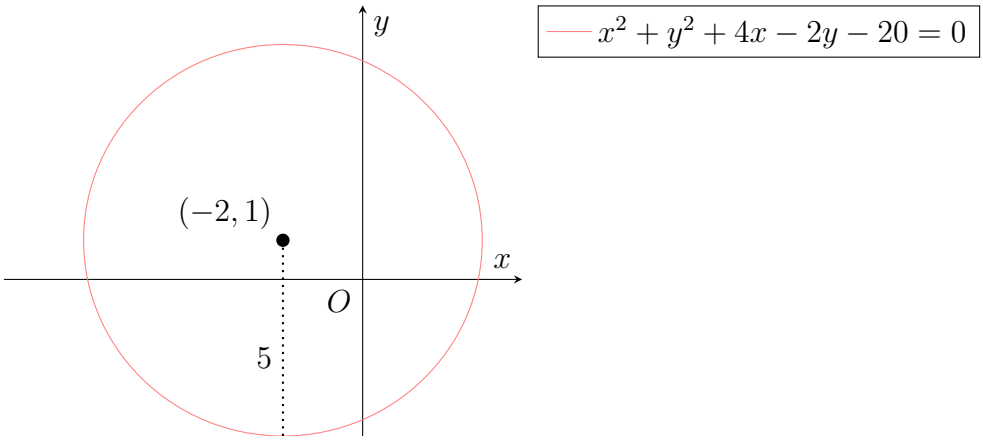
State a transformation that will transform the graph of (a) to a circle with centre $(0, 0)$ and radius $\sqrt{3}$.

## Solution

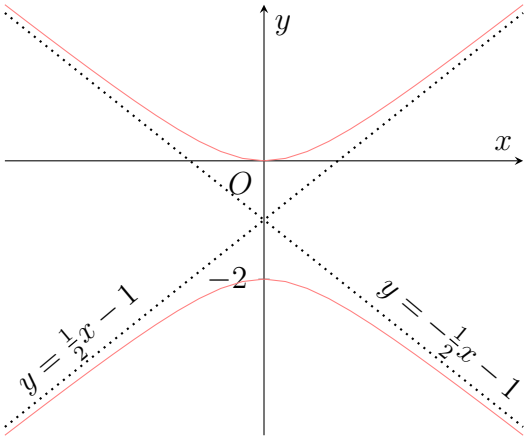
### Part (a)




### Part (b)



**Part (c)**




$$x \mapsto \sqrt{\frac{2}{3}}x$$

# Problem 2.

The curve $C$ has paramteric equations

$$x = t^2 + 4t,\ y = t^3 + t^2$$

Sketch the curve for $-2 \leq t \leq 1$, stating the axial intercepts.

## Solution