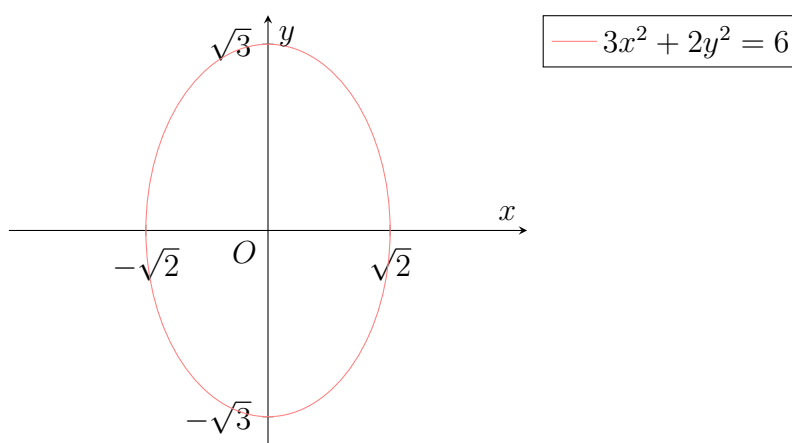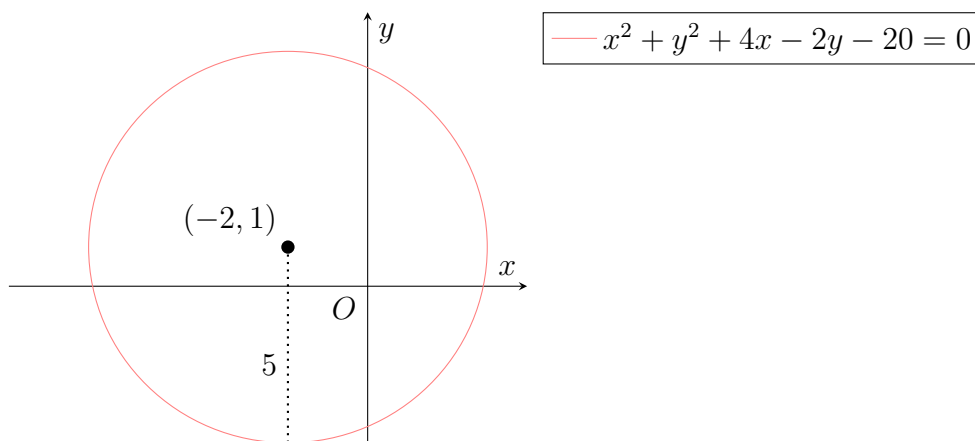# Problem 1.

Without using a calculator, sketch the graphs of the conics in parts (a), (b) and c.
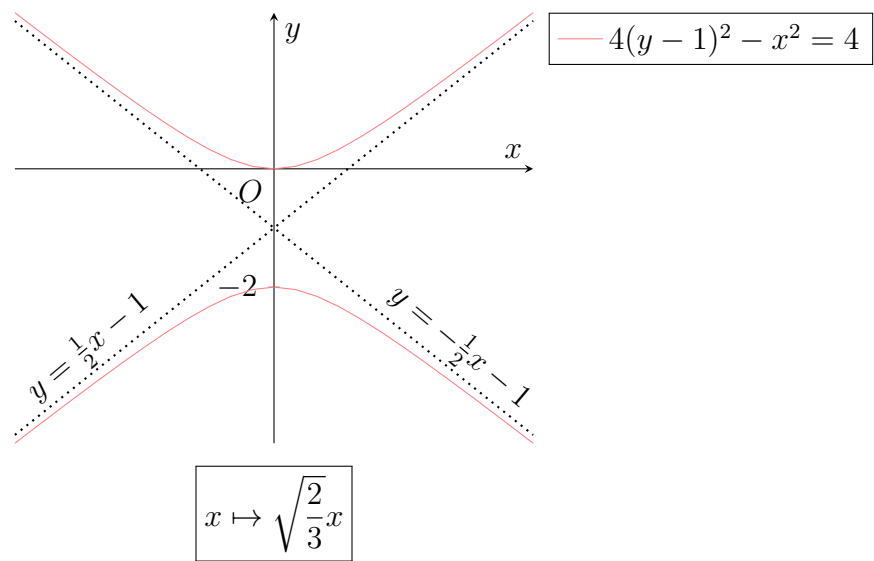
(a) $3x^2 + 2y^2 = 6$

(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)

The figure shows the curve $4(y-1)^2 - x^2 = 4$ with asymptotes $y = \frac{1}{2}x - 1$ and $y = -\frac{1}{2}x - 1$, and the point -2 marked on the y-axis.

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

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Problem 2.

The curve C has parametric equations

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

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

Solution