

[gex24] ODE for two-parameter family of conics

The two-parameter family of curves,

$$ax^2 + by^2 = 1,$$

are well known to describe conic sections.

- (a) Construct a 2nd-order ODE for the function $y(x)$ for which this family of curves is equivalent to the general solution. That ODE must be free of parameters.
- (b) Use the `DSolve` of Mathematica to find the general solution of the ODE thus constructed.
- (c) Relate the integration constants of that solution to the parameters a and b .

Solution: