Section 31.1: Cont'd

example: Consider the following DE:

$$\frac{dy}{dx} = 2xy$$

Is $y = x^2$ a   solution?

$$\frac{dy}{dx} = 2x \qquad \text{from} \quad y = x^2$$

plug into $\frac{dy}{dy} = 2xy$

$$2x = 2x \cdot x^2$$
$$2x = 2x^3 \qquad\qquad X$$

conclusion: NO

_____

two types of solutions:

explicit   →   solve for y

$$x^2 + y^2 = cx \qquad\qquad \leftarrow \text{not explicit}$$

$$y^2 = cx - x^2$$

$$y = \pm \sqrt{cx - x^2} \qquad \Leftarrow \text{ now it's explicit}$$

implicit $\rightarrow$ $\quad x^2 + y^2 = cx \qquad \Leftarrow$ can stop here

$\rightarrow$ do not need to solve for any
  particular variable