Explicit differentiation – equation is in the form \( y = f(x) \) (That is, \( y \) is on the side by itself.)

Ex - \( y = x^2 - 5x - 3 \)
\[
 y' = 
\]

Implicit differentiation – equation is not in the \( y = f(x) \) form. In fact, \( x \)'s and \( y \)'s are all mixed up.

Ex - \( x^2 - 3 = 5x + y \)

What is:

\[
\frac{d}{dx} f(x) ?
\]
\[
\frac{d}{dx} [f(x)]^3 ?
\]
\[
\frac{d}{dx} y^3 ?
\]
\[
\frac{d}{dx} \sin x ?
\]
\[
\frac{d}{dx} \sin[f(x)] ?
\]
\[
\frac{d}{dx} \sin y ?
\]

So, every time you see a \( y \), there should be a _____ term when differentiating.

Examples – Remember that you are solving for \( y' \).

(1) \( x^2 + y = \tan x \)  
(2) \( 3x^3 + xy = y \)  
(3) \( \sin(xy) = 1 \)

(4) \( y^3 - xy = \csc 2x \)  
(5) \( x^2y - xy^2 = 6y \)