4.5 Implicitly Defined Functions

AP Precalculus Name: _____ **CA #1**

1. Which of the following sets of ordered pairs satisfy the implicitly defined function $x^2 + 3xy + y^2 - 5 = 0$.

   (A) $(0, \sqrt{5}), (-\sqrt{5}, 0), (1, -4), (1, -1)$

   (B) $(0, -\sqrt{5}), (\sqrt{5}, 0), (1,5), (1, -1)$

   (C) $(0, \pm\sqrt{5}), (\pm\sqrt{5}, 0), (1, -4), (1,1)$

   (D) $(0, \pm\sqrt{5}), (\pm\sqrt{5}, 0), (1,5), (1,1)$

   (E) None of these satisfy the given function.

2. The equation $x^2 + y^2 - 2 = 0$ represents a circle.

   a. Solve for one of the variables that would give an explicit equation for the **top** half of the circle.

   b. Solve for one of the variables that would give an explicit equation for the **left** half of the circle.

3. Find the rate of change of y with respect to x and determine how the two quantities in the implicitly defined function $5x^2 + y^2 - 20 = 0$ vary together on the interval $0 \le x \le 2$, and $y \le 0$.

4. The ordered pair $(1, 3)$ is on the graph of an implicitly defined function. Which of the following ordered pairs would indicate a horizontal interval when paired with the given ordered pair?

   (A) $(-1, 7)$ (B) $(1, -7)$ (C) $(8, 3)$ (D) $(-8, -3)$

Answers to 4.5 CA #1

1. C	2a. $y = \sqrt{2 - x^2}$	2b. $x = -\sqrt{2 - y^2}$	3. $\frac{\Delta y}{\Delta x} = \sqrt{5}$, Both variables simultaneously increase or decrease.	4. C