Names (pair) _____ Date _____

The Signs of the Solutions

the solutions are	conditions
both positive	$D \geq 0,\ x_1 x_2 > 0,\ x_1 + x_2 > 0$
both negative	$D \geq 0,\ x_1 x_2 > 0,\ x_1 + x_2 < 0$
of opposite signs	$x_1 x_2 < 0$ (then $D > 0$ for sure)
one of them is 0	$x_1 x_2 = 0$, that is $c = 0$

1 IN PAIRS Do not solve. Find the signs of the solutions using the discriminant and Vieta's formulas. **Student A** does the top three equations and **student B** the bottom three. Then each of you solves one of your partner's equations and checks the conclusion.

	equation	D	$x_1 x_2$	$x_1 + x_2$	signs
student A	$x^2 - 7x + 10 = 0$				
	$x^2 + 2x - 15 = 0$				
	$x^2 + 6x + 5 = 0$				
student B	$x^2 + 8x + 12 = 0$				
	$2x^2 - 9x + 4 = 0$				
	$3x^2 + x - 4 = 0$				

Names (pair) _____ Date _____

2 IN PAIRS For which m does $x^2 - 4x + m = 0$ have two different positive solutions?

$D > 0$: ☐

$x_1 x_2 > 0$: ☐

$x_1 + x_2 > 0$: ☐

All three conditions: ☐

3 IN PAIRS For which m does $x^2 + 3x + m - 2 = 0$ have solutions of opposite signs?

4 IN PAIRS For which m does $x^2 + 2(m-1)x + 4 = 0$ have two different negative solutions?
Factorise the discriminant, $D = 4(m-3)(m+1)$, and solve $D > 0$ with a sign table.

m	$-\infty$	☐		☐	$+\infty$
$m-3$					
$m+1$					
D					

$D > 0$: ☐ $x_1 x_2 =$ ☐ $x_1 + x_2 < 0$: ☐

Answer: ☐

★ ON YOUR OWN **Exit card.** Without solving, find the signs of the solutions of $x^2 - 5x - 6 = 0$.