Names (pair) _____ Date _____

Equations with a Parameter

Remember

A **parameter** is a letter that stands for a given number. We solve $ax = b$ by **discussing the cases**: if $a \neq 0$, the solution is $x = \frac{b}{a}$; if $a = 0$ and $b \neq 0$, there is no solution; if $a = 0$ and $b = 0$, every real number is a solution.

1 IN PAIRS Put the values of the parameter into $(a - 1)x = a + 1$ and solve.

a	Equation	Solution
3		
2		
1		
0		
-1		

2 ON YOUR OWN Now solve $(a - 1)x = a + 1$ for any a. When does it have no solution?

For $a \neq$ ☐ : $x =$ ☐ For $a =$ ☐ : ☐

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3 ON YOUR OWN Discuss the equation $(a+2)x = a^2 - 4$. Hint: factorise the right side.

4 IN PAIRS For which a does $3x + a = x - 5$ have the solution $x = 2$?

$a =$ ☐

5 ON YOUR OWN For which m does $mx - 4 = 2x$ have no solution? Explain.

$m =$ ☐

6 IN PAIRS CHALLENGE For which k does $k(x-1) = 2x - 2$ have infinitely many solutions?

$k =$ ☐

★ ON YOUR OWN **Exit card.** For which a does $ax = 3$ have no solution? $a =$ ☐