Name _____ Date _____

Algebraic Fractions: Simplifying

Example

Numbers: $\frac{12}{18} = \frac{6 \times 2}{6 \times 3} = \frac{2}{3}$

Expressions: $\frac{x^2 - 9}{x^2 + 3x} = \frac{(x-3)(x+3)}{x(x+3)} = \frac{x-3}{x}$, with $x \neq 0$ and $x \neq -3$

Remember

First **factorise** the numerator and the denominator, then cancel the **common factors**. Terms that are added are never cancelled. The denominator must not be 0, and we find the conditions from the **original** fraction.

1 ON YOUR OWN For which x is the fraction not defined?

$\frac{5}{x-2}$: ☐

$\frac{x}{x^2-4}$: ☐

$\frac{3}{x^2+1}$: ☐

$\frac{x+1}{x(x+5)}$: ☐

2 ON YOUR OWN Simplify. Write the conditions too.

$\frac{6x}{9x^2} =$ ☐

$\frac{3a+6}{a+2} =$ ☐

$\frac{x^2-1}{x+1} =$ ☐

$\frac{x^2+5x}{x^2-25} =$ ☐

$\frac{a^2-4a+4}{a^2-4} =$ ☐

$\frac{2x-6}{9-3x} =$ ☐

Names (pair) _____ Date _____

3 IN PAIRS **Can you cancel?** Check by substituting $x = 1, y = 2$. Correct the false ones.

$\frac{x+3}{x+5} = \frac{3}{5}$ **true** / **false**

Correction: _____

$\frac{2x}{2y} = \frac{x}{y}$ **true** / **false**

Correction: _____

$\frac{x^2+y^2}{x+y} = x+y$ **true** / **false**

Correction: _____

4 IN A GROUP **Don't lose the conditions.** We have $\frac{x^2-4}{x-2} = x+2$. What happens at $x = 2$ on the left side, and what on the right?

_____

_____

5 ON YOUR OWN Simplify and write the conditions.

$\frac{x^2+2x+1}{x^2-1} =$ ☐ $\frac{a^3-1}{a^2-1} =$ ☐

★ ON YOUR OWN **Exit card.** Simplify: $\frac{x^2-3x}{x^2-9} =$ ☐