

Equivalent Rational Expressions

If two rational expressions can be reduced to the same rational expression, then the two rational expressions are called equivalent rational expressions

Examples: $\frac{6x}{9x}$ and $\frac{2}{3}$ are equivalent fractions.

$$\frac{6x}{9x} = \frac{2 \cdot \cancel{3} \cdot x}{3 \cdot \cancel{3} \cdot x} = \frac{2}{3}$$

$\frac{6y}{2y+6}$ and $\frac{2y}{y+3}$ are not equivalent

$$\frac{6y}{2y+6} = \frac{\cancel{2} \cdot 3 \cdot y}{\cancel{2}(y+3)} = \frac{3y}{y+3}$$

$\frac{2y}{y+3}$ is in reduced form

$$\frac{3y}{y+3} \neq \frac{2y}{y+3}$$

Equivalent fractions in signed number systems

$$\frac{-p}{q} = \frac{p}{-q} = -\frac{p}{q}$$

$$\frac{p}{q} = -\frac{-p}{q} = -\frac{p}{-q} = \frac{-p}{-q}$$

Examples:

$$\frac{1}{y-x} = \frac{-1}{-(y-x)} = \frac{-1}{x-y}$$

$$\frac{a-b}{x-y} = \frac{-(b-a)}{-(y-x)} = \frac{b-a}{y-x}$$