Properties and Operations of Fractions

	Property:	**Example:**
Add or Subtract with *like* denominators:	$\frac{a}{b}+\frac{c}{b}=\frac{a+c}{b}$	$\frac{2}{5}+\frac{3x}{5}=\frac{2+3x}{5}$
Add or Subtract with *unlike* denominators:	$\frac{a}{b}+\frac{c}{d}=\frac{ad}{bd}+\frac{cb}{bd}=\frac{ad+cb}{bd}$	$\frac{2}{5}+\frac{4}{7}=\frac{2\cdot 7}{5\cdot 7}+\frac{4\cdot 5}{7\cdot 5}=\frac{14+20}{35}=\frac{34}{35}$
Multiply Fractions:	$\frac{a}{b}\cdot\frac{c}{d}=\frac{ac}{bd}$	$\frac{2x}{5}\cdot\frac{3x}{7}=\frac{6x^2}{35}$
Divide Fractions:	$\frac{\frac{a}{b}}{\frac{c}{d}}=\frac{a}{b}\cdot\frac{d}{c}$	$\frac{\frac{2}{3}}{\frac{5}{4}}=\frac{2}{3}\cdot\frac{4}{5}=\frac{8}{15}$
	$\frac{a}{b}\div\frac{c}{d}=\frac{a}{b}\cdot\frac{d}{c}$	$\frac{2}{3}\div\frac{5}{4}=\frac{2}{3}\cdot\frac{4}{5}=\frac{8}{15}$
Equivalent Fractions:	$\frac{a}{b}=\frac{ac}{bc}$ where $c\neq 0$	$\frac{2}{3}=\frac{2\cdot 4}{3\cdot 4}=\frac{8}{12}$
	$\frac{a}{b}=\frac{c}{d}$ if and only if $ad=bc$	$\frac{1}{2}=\frac{2}{4}$ because $1\cdot 4=2\cdot 2$
Reducing Fractions:	$\frac{ac}{bc}=\frac{a}{b}$	$\frac{2}{4}=\frac{1\cdot\cancel{2}}{2\cdot\cancel{2}}=\frac{1}{2}$
Rules of Signs:	$-\frac{a}{b}=\frac{-a}{b}=\frac{a}{-b}$	$-\frac{2}{5}=\frac{-2}{5}=\frac{2}{-5}$
	$\frac{-a}{-b}=\frac{a}{b}$	$\frac{-2}{-5}=\frac{2}{5}$