Commutative Property (of + and x)	$a + b = b + a$ $c \cdot d = d \cdot c$	
Associative Property (of + and x)	$(a + b) + c = a + (b + c)$ $(c \cdot d) \cdot e = c \cdot (d \cdot e)$	
Identity Property of addition	$x + 0 = x$	
Identity Property of Multiplication	$x \cdot 1 = x$	

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Adding and Subtracting Like Fractions

like fractions - the fractions already have a common denominator

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Steps

- add or subtract the numerators (when needed, change addition to ADDING THE OPPOSITE)
- keep the same denominator
- simplify if needed

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**Always attach negative sign to the numerator!

$\frac{5}{9} + \frac{7}{9}$

$\frac{1}{6} + \frac{5}{6}$

$\frac{3}{8} + \frac{5}{8}$

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Adding Mixed Numbers

$2\frac{5}{8} + 6\frac{1}{8}$

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$2\frac{3}{7} + 1\frac{5}{7}$

$8\frac{1}{4} + 4\frac{2}{4}$

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Subtracting Mixed Numbers

**rewrite vertically!

Example: $3\frac{5}{8} - 1\frac{1}{8}$

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Subtracting with regrouping: Rewrite vertically

$4\frac{3}{5} - 2\frac{4}{5}$

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$5\frac{2}{9} - 2\frac{4}{9}$ $8\frac{1}{5} - 4\frac{2}{5}$

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Adding and Subtracting Unlike Fractions

unlike fractions - fractions that do not have a common denominator

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Try to use the least common multiple as the common denominator.
First look to see if the smaller # fits in the bigger #.
When stuck - multiply the denominators

Examples:

$\frac{5}{12} + \frac{1}{6}$ $\frac{5}{8} + \frac{3}{20}$

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$\frac{3}{5} + \frac{2}{3}$

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$\frac{5}{9} + \frac{1}{6}$

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$3\frac{3}{4} - 1\frac{1}{3}$

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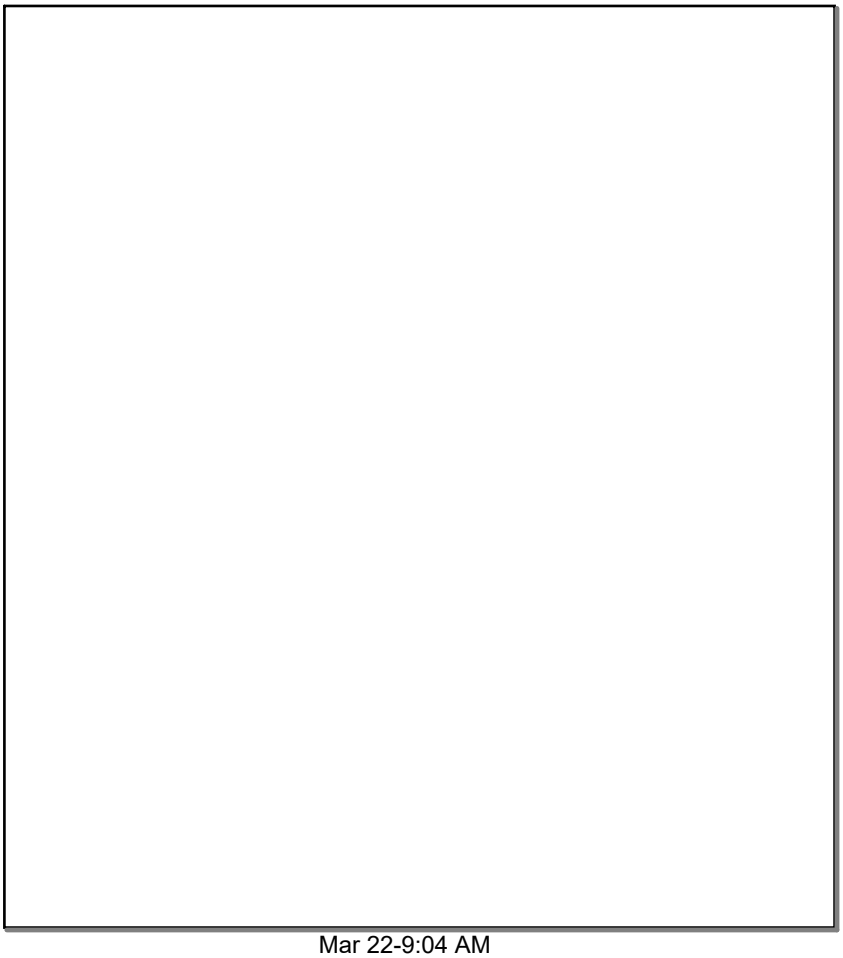

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