Adding, Subtracting, Multiplying and Dividing Fractions

Quick Review			
Multiplying Fractions	Multiply Across	$\dfrac{a}{b} \times \dfrac{c}{d} = \dfrac{ac}{bd}$	$\dfrac{2}{3} \times \dfrac{5}{7} = \dfrac{10}{21}$
Change a Fraction to Higher Terms	Multiply by $\dfrac{n}{n}$	$\dfrac{a}{b} = \dfrac{a}{b} \times \dfrac{n}{n} = \dfrac{an}{bn}$	$\dfrac{2}{3} = \dfrac{2}{3} \times \dfrac{4}{4} = \dfrac{8}{12}$
Adding or Subtracting Fractions with the Same Denominator	Add Across	$\dfrac{a}{d} + \dfrac{b}{d} = \dfrac{a+b}{d}$	$\dfrac{3}{4} + \dfrac{7}{4} = \dfrac{10}{4}$
Adding or Subtracting Fractions with Different Denominators	First Change to a Common Denominator	$\dfrac{2}{3} + \dfrac{3}{4} = \dfrac{2}{3} \times \dfrac{4}{4} + \dfrac{3}{4} \times \dfrac{3}{3}$ $= \dfrac{8}{12} + \dfrac{9}{12} = \dfrac{17}{12}$	
Dividing Fractions	Multiply by the Reciprocal of the Second	$\dfrac{a}{b} \div \dfrac{c}{d} = \dfrac{a}{b} \times \dfrac{d}{c} = \dfrac{ad}{bc}$	$\dfrac{2}{3} \div \dfrac{3}{5} = \dfrac{2}{3} \times \dfrac{5}{3} = \dfrac{10}{9}$
Reducing Fractions	Remove <u>common factors</u> from numerator and denominator	$\dfrac{ad}{bd} = \dfrac{a\cancel{d}}{b\cancel{d}} = \dfrac{a}{b}$ $\underline{\text{never}} \quad \dfrac{a+d}{bd} \neq \dfrac{a+\cancel{d}}{b\cancel{d}}$	

Problems (No Calculators!)

1. Reduce these fractions to lowest terms

   a. $\dfrac{68}{52}$ b. $\dfrac{24}{72}$ c. $\dfrac{42}{28}$ d. $\dfrac{168}{126}$

2. Simplify these computations to a whole number or fraction in lowest terms.

a. $\dfrac{13}{14} \times \dfrac{21}{26}$

b. $\dfrac{16}{9} \times \dfrac{1}{48}$

c. $\dfrac{35}{63} \times 18$

d. $8 \times \dfrac{63}{36}$

e. $\dfrac{10}{21} \div \dfrac{2}{3}$

f. $\dfrac{5}{2} \div \dfrac{3}{5}$

g. $\dfrac{5}{3} \div 5$

h. $\dfrac{4}{15} \div \dfrac{20}{9}$

3. Simplify these computations to a whole number or fraction in lowest terms.

a. $\dfrac{3}{4} - \dfrac{2}{3}$

b. $\dfrac{1}{9} + \dfrac{3}{8}$

c. $\dfrac{5}{6} + 3$

d. $13 - \dfrac{63}{5}$

e. $\dfrac{1}{2} + \dfrac{2}{3} + \dfrac{3}{4}$

f. $\dfrac{5}{2} - \dfrac{3}{5}$

g. $\dfrac{5}{3} + \dfrac{2}{9}$

h. $\dfrac{4}{15} + \dfrac{4}{30}$