Math 4. Class Work 9

Expressions

- Set of operations that must be performed on terms, including numbers and variables, to receive a more straightforward expression or an exact numerical answer.
    - Opening the parenthesis (brackets) that uses the distributive property
    - Addition of similar terms

Multiplication of fractions by a number.

- To multiply a fraction by a number, simply multiply the numerator by the number.
- Finding a part of a whole number involves multiplying the fraction by the number.

$\frac{2}{7} \cdot 3 = \frac{2}{7} + \frac{2}{7} + \frac{2}{7} = \frac{2+2+2}{7} = \frac{3 \cdot 2}{7} = \frac{6}{7}$ (this is also finding 2/7 of 3)

Multiplication of fraction by a fraction.

- To multiply two fractions, we need to multiply the numerators, multiply the denominators, and reduce the fractions, if possible.
- Finding a part of a fraction involves multiplying the fractions together.

Examples: $\frac{3}{8} \cdot \frac{2}{7} = \frac{3 \cdot 2}{4 \cdot 2 \cdot 7} = \frac{3 \cdot 2}{4 \cdot 7 \cdot 2} = \frac{3}{4 \cdot 7} = \frac{3}{28}$ (this is also 3/8 of 2/7)

Division of fractions.

- To divide one fraction by another, we multiply the dividend by the **inverse fraction**.
- An inverse fraction has the numerator and denominator switched, so the product of the original and its inverse fraction is 1. Inverse fractions can also be called reciprocal.

Example: $\frac{4}{3}$ has a reciprocal of $\frac{3}{4}$, and $\frac{4}{3} \cdot \frac{3}{4} = 1$

Complex fractions

- Complex fractions are formed by two fractional or two numeral expressions, one on the top and the other on the bottom. Simplify the expressions first. Remember – the fraction line means division

Example: $\frac{(2+3) \cdot 5}{7 - \frac{1}{2}} = \left((2+3) \cdot 5\right) : \left(7 - \frac{1}{2}\right) = (5 \cdot 5) : \left(\frac{7 \cdot 2 - 1}{2}\right) = 25 : \left(\frac{13}{2}\right) = 25 \cdot \frac{2}{13} = \frac{50}{13}$

Problems:

1. Underline the similar terms and add/subtract them to simplify the expression
   a) $x + 6 + 3y + 4 + x - 15 - 6y + 2x =$
   b) $2a - 45 + y + 90 + 5a =$

2. Open (remove) the parentheses:

   a) $2 \cdot (11x - 7y) =$ _____
   b) $(5y - 7x) \cdot 3 =$ _____
   c) $(3w + 1) \cdot 3 =$ _____
   d) $4 \cdot (3 - 2w) =$ _____
   e) $(2x + 3) \cdot 2 + 1 =$

3. Show that the left side is equal to the right side by opening the parentheses and collecting similar terms

   a) $2 \cdot (11x - 7y) + (5y - 7x) \cdot 3 = x + y$

   b) $(3w + 1) \cdot 3 + 4 \cdot (3 - 2w) = 15 + w$

4. Quick fractions break (do as many as you can in 5 minutes)

   a) Find … $\frac{3}{4} of 28$ $\frac{7}{11} of\ 55$ $\frac{3}{5} of 30$

   b) Add … $\frac{1}{11} + \frac{3}{11} =$ $\frac{2}{7} + \frac{3}{7} =$ $\frac{1}{9} + \frac{4}{9} =$

   c) Simplify using factoring…

   $\frac{4}{20} =$ $\frac{6}{8} =$ $\frac{12}{18} =$

6. Expand where necessary to make the same denominators and to compare (>, <, or =):

$\frac{4}{5} \square \frac{3}{7}$ $\frac{11}{16} \square \frac{5}{12}$ $\frac{7}{12} \square \frac{5}{9}$

5. Draw a number line with a unit segment equal to 10 cells and mark the fractions:

$$\frac{1}{5};\ \frac{2}{5};\ \frac{3}{5};\ \frac{5}{5};\ \frac{6}{5};\ \frac{8}{5}.$$

6. A cyclist planned her ride in advance. She covered 1/4 of the distance in the first hour. During the second hour, she drove 1/5 of the distance, and during the third hour, she covered 3/10 of the distance. How much more does she still need to cover?

7. Solve the equations in your notebook:

   a) $8-\frac{1}{5}x=2$

   b) $\frac{1}{5}x+7=9$

9. Complex fractions (some from the homework)

   a) $\frac{\frac{7}{10}+\frac{1}{3}}{\frac{7}{10}+\frac{1}{2}}$;

   b) $\frac{2-\frac{\frac{1}{2}-\frac{1}{4}}{2}}{2+\frac{\frac{1}{2}-\frac{1}{4}}{2}}$

   c) $\frac{3\frac{1}{5}}{\left(1\frac{5}{6}\cdot 1\frac{5}{22}\right):18\cdot 5}$

10 . The sum of all numbers in the square is 10. What number should be placed in the **?** box?

$2\frac{1}{7}$	$5\frac{4}{7}$
$\frac{3}{7}$	?

$1\frac{4}{5}$	$3\frac{2}{5}$
?	$2\frac{1}{5}$