Math 4d. Classwork 11.

Algebra.

Warm up:

$(4.43 + 3.753) + 5.57 =$

$8.375 \cdot 6.34 + 3.66 \cdot 8.375 =$

$(2.38 - 1.89) + 7.62 =$

$589.567 : 10 =$ $786 : 10 =$

$654.1 : 1000 =$ $789.564 \cdot 100 =$

$654.3 \cdot 1000 =$ $0.45 : 1000 =$

1. Complex fractions.

Complex fractions are formed by two fractional expressions, one on the top and the other one on the bottom, for example:

$$\frac{\frac{1}{2}+\frac{1}{3}}{\frac{7}{9}-\frac{2}{5}}$$

We know that fraction bar is a just another way to write the division sign, so the above expression is equivalent to

$$\frac{\frac{1}{2}+\frac{1}{3}}{\frac{2}{3}+\frac{1}{4}} = \left(\frac{1}{2}+\frac{1}{3}\right) : \left(\frac{2}{3}+\frac{1}{4}\right)$$

And it is easy to simplify a complex fraction:

$$\frac{\frac{1}{2}+\frac{1}{3}}{\frac{2}{3}+\frac{1}{4}} = \left(\frac{1}{2}+\frac{1}{3}\right) \div \left(\frac{2}{3}+\frac{1}{4}\right) = \frac{\frac{3}{6}+\frac{2}{6}}{\frac{8}{12}+\frac{3}{12}} = \frac{\frac{5}{6}}{\frac{11}{12}} = \frac{5}{6} \div \frac{11}{12} = \frac{5}{6} \cdot \frac{12}{11} = \frac{5}{1} \cdot \frac{2}{11} = \frac{10}{11}$$

Exercises.

1. Compute:

$a.\dfrac{6}{1-\frac{1}{3}}$; $b.\ \dfrac{1-\frac{1}{6}}{2+\frac{1}{6}}$; $c.\ \dfrac{\frac{1}{2}+\frac{3}{4}}{\frac{1}{2}}$ $d.\ \dfrac{\frac{7}{10}+\frac{1}{3}}{\frac{7}{10}+\frac{1}{2}}$; $e.\dfrac{2-\frac{\frac{1}{2}-\frac{1}{4}}{2}}{2+\frac{\frac{1}{2}-\frac{1}{4}}{2}}$;

2. Robert and John live 12 miles apart. They start walking toward each other. At the same time a Robert's dog starts running towards John at a speed of 6 mile per hour. After meeting John, the dog turns around and runs back to Robert and so forth until all three meet. Robert walks at a speed of 5 mph and John's speed is 4 mph. How many miles does the dog run?

3. Andrew is walking along a narrow bridge. When Andrew passes exactly 1/3 of the length of the bridge, he notices a cyclist on the road to the bridge heading after him. If Andrew will starts walking toward the cyclist, they will meet at the beginning of the bridge. If he will continue toward the end of the bridge, the cyclist will catch up with him at the end of the bridge. How many times is the speed of the cyclist higher than the speed of the walker?

4. A cat can eat the sausage in 10 minutes, a dog can eat it in 2.5 minutes. How fast will they eat the sausage together?