

MATH 5: HANDOUT 5
ALGEBRAIC EXPRESSIONS AND FRACTIONS

BRAIN TEASERS

1. Using only addition, add eight 8s to get to the number 1000.
2. $a + b + c = d$, and $a \times b \times c = d$. What numbers make these two equations true?

DIVISION AND FRACTIONS

Today we discussed the last set of rules for arithmetic operations, involving division and fractions. The easiest way to remember them is to rewrite $a \div b$ in fraction form, as $\frac{a}{b}$. Then the rules are

$$\begin{aligned}\frac{a}{b} \times \frac{c}{d} &= \frac{ac}{bd} \\ \frac{a}{b} \div \frac{c}{d} &= \frac{a}{b} \times \frac{d}{c} = \frac{ad}{bc} \\ \frac{a+b}{c} &= \frac{a}{c} + \frac{b}{c} \quad \frac{a-b}{c} = \frac{a}{c} - \frac{b}{c}\end{aligned}$$

Example:

$$a \div (b \div c) = a \div \frac{b}{c} = a \times \frac{c}{b} = \frac{ac}{b}$$

This can be used to solve equations. For example: to solve equation $\frac{5}{7}x = 15$, we multiply it by 7 to get $5x = 105$, then divide by 5 to get $x = 21$. Or we could solve it faster by multiplying both sides by $\frac{7}{5}$, to get

$$x = 15 \times \frac{7}{5} = \frac{15 \times 7}{5} = 21$$