

# Math Circle – Language Puzzles

22 March, 2012

1. Consider the following symbolic notation:

A 1 B    A ate B

C: (A 1 B)    C caused (on purpose) A to eat B

Now, likewise, let “2” mean “saw” and let “3” mean “had”.

Write the following fable of Aesop using symbolic notation (possibly simplifying the meaning at times). Use “C” for Crow, “F” for Fox, and “H” for Cheese.

Crow had some cheese. Fox noticed the cheese. Fox tried to catch Crow’s attention. Crow boasted the cheese to Fox. Fox took the cheese.

Now, translate this into English:

F: (F 3 H); F: (C 2 H); F 1 H; C: (F 1 H).

2. **Classical Nahuatl.** In many languages of the world, whole sentences can be expressed with a single word. This is true in Classical Nahuatl, the language of the Aztec Empire that flourished in what is now Mexico between 1325 and 1522 C.E.. In the following puzzle, try to divide each Nahuatl word into its various parts, and then fill in the translations at the end.

The symbol “:” after a vowel simply means that the vowel is pronounced longer than otherwise. It does not necessarily mean that the word must be divided at that point.

nicho:ka	I cry	tikochi	You sleep
nicho:kani	I am crying	ancho:kah	Y’all cry
ankochinih	Y’all are sleeping	tikochis	You will sleep
tikochih	We sleep	ticho:kayah	We were crying
kochiya	He was sleeping	cho:ka	He cries
kwi:kas	He will sing	kochini	He is sleeping
ankochiyah	Y’all were sleeping	ancho:kayah	Y’all were crying
nicho:kas	I will cry	ticho:kanih	We are crying
cho:kayah	They were crying	kwi:kah	They sing
tikwi:kani			They sleep
nikwi:kaya			I will sleep
cho:kanih			You will cry

*Credit: Tom Payne*

3. **Danish.** Given are some equations in the Danish language. Your job is to fill in the blanks!

$$\begin{aligned}
 \text{fem} \times \text{fir} &= \text{tyve} \\
 \text{fem} \times \text{fem} &= \text{femotyve} \\
 \text{fireofirsinstyve} + \text{seks} &= \text{halvfemsinstyve} \\
 \text{seksotresinstyve} + \text{niden} &= \text{femofirsinstyve} \\
 \text{femden} + \text{femotresinstyve} &= \text{firsinstyve} \\
 \text{treden} + &= \text{niotyve} \\
 \text{seks} \times \text{ni} &= \\
 \text{niotresinstyve} + \text{fireotyve} &=
 \end{aligned}$$

4. **Czech.** Czech is the official language of the Czech Republic, the western two thirds of the former Czechoslovakia. It is spoken by about nine and a half million people and belongs to the western branch of Slavic languages.

The Czech spelling system uses special letters for certain sounds; you will also find a few of them in this puzzle, including the following:

- ě pronounced as the first syllable of the word “yellow”
- č pronounced as the first sound in the word “Czech”
- š pronounced as the first sound in the word “shop”
- é pronounced approximately as the last sound in the word “café”
- ů pronounced as the last sound in the word “stew”
- á pronounced approximately as the first sound in the word “argue”

The following are examples of how to say in Czech what time it is:

five minutes to eight	za pět minut osm
ten minutes to eight	za deset minut osm
quarter after seven	čtvrt na osm
seven minutes to eight	za sedm minut osm
seven minutes after seven	za osm minut čtvrt na osm
five minutes after six	za deset minut čtvrt na sedm
half past seven	půl osmé
half past eight	půl deváté
twenty minutes after five	za deset minut půl šesté
quarter after nine	čtvrt na deset

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twenty-three minutes after five  
ten minutes after nine

*Credit: Mirjam Fried*