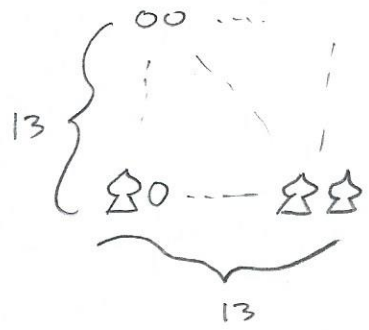
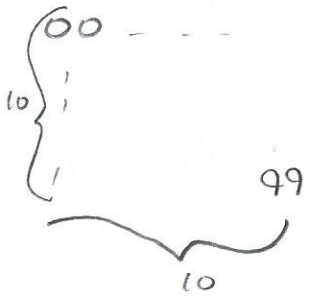
Van Miller
MATH 1350
Math for Elem. School Teachers
Dr. Alm 9-6-18

◊5☆ = ◊00 + 50 + ☆



$13^2 = 169$ symbols



$10^2 = 100$ symbols

Hindu-Arabic	base 13
169	100
$11 \times 169 = 1859$	◊00
$5 \times 13 = 65$	50
12	☆

◊5☆ = ◊00 + 50 + ☆ = 1859 + 65 + 12 = **1,936**

A good way to solve:

$572 = 500 + 70 + 2$

$= 5 \times 10^2 + 7 \times 10^1 + 2 \times 10^0$

◊5☆ = ◊$\times 13^2$ + 5$\times 13^1$ + ☆$\times 13^0$

Ch. 2

Associative law of addition: For any whole numbers a, b, c,

$$(a+b)+c = a+(b+c)$$

Commutative law of addition: For any whole numbers a, b,

$$a+b = b+a$$

Associative law of multiplication: For any whole numbers a, b, c,

$$a(bc) = (ab)c$$

Commutative law of multiplication: For any whole numbers a, b,

$$ab = ba$$

Ex:

skip count 2 rows in 2 digit grid

$$23+51 = (20+3) + (50+1)$$

skip 3 steps

$$= (50+20) + (3+1) \quad \Rightarrow \text{Using Associative law}$$

$$= (70) + (4)$$

7 rows

$$= \boxed{74}$$

Ex: Addition Algorithm:

$$\begin{array}{r} 23 = (20+3) \\ +51 = (50+1) \\ \hline 74 = 70+4 \end{array}$$

Ex. $18+17 = (10+8)+(10+7)$

$= (10+10)+(8+7)$

$= 20 + 15$

$= 20 + (10+5)$

$= (20+10) + 5$

$= 30+5$

$= 35$

Ch. 2 Prob. 8

$(x+y)(x+y) = xx + xy + yx + yy$

☆ We will need to use distributive law twice!

$(x+y)(x+y)$ (a = $(x+y)$, b = x, c = y)

Distributive Law: For any whole numbers a, b, c,

(i) $a(b+c) = ab + ac$

(ii) $(a+b)c = ac + bc$

$(x+y)(x+y) = (x+y)x + (x+y)y$ by (i)

$= xx + yx + xy + yy$ by (ii)

$= xx + xy + yx + yy$ by Commutative

$xy + x^2 = x(y+x)$

$2x + 3x = (2+3)x$

Prob. Count with 0, 1, 2

$$\begin{array}{r} 1 \\ 212 \\ +\ 102 \\ \hline 1021 \end{array}$$

00 01 02

10 11 12

20 21 22

Same thing as:

$212 + 102 = (200+10+2) + (100+2)$

$= (200+100) + (10) + (2+2)$

$= 1000 + 10 + 11$

$= 1000 + (10+10) + 1$

$= 1000 + 20 + 1$

$= 1021$