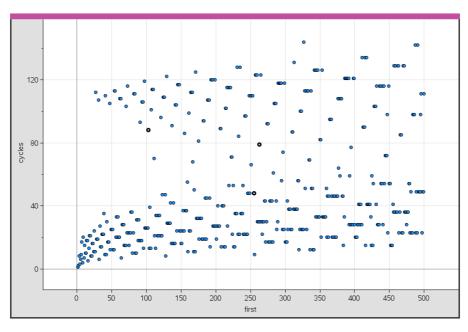
More Functions for the Handheld TIs Matthew Myers, USA

Matthew Myers sent a new bundle of TI-handheld (TI-89, TI-92 and Voyage 200) programs via his mentor Robert Haas. All files are contained in MTH122.zip. I present his functions as Nspire-procedures which are part of the library mm.tns which is to be stored in the TI-NspireCX\MyLib-folder. I will not reprint the function codes but present the results on screen shots.

$\bok_say(3,6) & \{3,13,1113,3113,132113,1113122113,31131122113\}\\ bok_say(2,7) & \{2,12,1112,3112,113122112,311311222112,13211321$		
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	look_say(3,6)	{3,13,1113,3113,132113,1113122113,311311222113}
$\begin{array}{c} in_one\{\{1,2,3,4,5,10\},\{1,2,4,6,7\}\} & \{3,5,10,6,7\} \\ in_one\{\{ab,ac,ad,ae\},\{ae,ab,bc\}\} & \{ac,ad,bc\} \\ in_both\{\{1,2,3,4,5,10\},\{1,2,4,6,7\}\} & \{1,2,4\} \\ in_both\{\{ab,ac,ad,ae\},\{ae,ab,bc\}\} & \{ab,ae\} \\ in_one[[1\ 2\ 3\ 4\ 5\ 10],[1\ 2\ 4\ 6\ 7]\} & \{3,5,10,6,7\} \\ in_both\{\{ab,ac,ad,ae\},[ae\ ab\ bc]\} & \{ab,ae\} \\ collatz_p(10) & \{10,50,25,76,38,19,58,29,88,44,22,11,34,17,52,26,13,40,20,10,5,16,84,2,1\} \\ collatz_i(100) & \begin{bmatrix} "\#" & 100 \\ "N" & 25 \\ "M" & 100 \end{bmatrix} \\ \end{array}$	$look_say(2,7)$	$\big\{2,12,1112,3112,132112,1113122112,311311222112,13211321$
$\begin{array}{llllllllllllllllllllllllllllllllllll$	$look_say(4,5)$	$\{4,14,1114,3114,132114,1113122114\}$
$\begin{array}{c} in_both(\{1,2,3,4,5,10\},\{1,2,4,6,7\}) & \{1,2,4\} \\ in_both(\{ab,ac,ad,ae\},\{ae,ab,bc\}) & \{ab,ae\} \\ in_one([1\ 2\ 3\ 4\ 5\ 10],[1\ 2\ 4\ 6\ 7]) & \{3,5,10,6,7\} \\ in_both(\{ab,ac,ad,ae\},[ae\ ab\ bc]) & \{ab,ae\} \\ collatz_p(10) & \{10,5,16,8,4,2,1\} \\ collatz_p(100) & \{100,50,25,76,38,19,58,29,88,44,22,11,34,17,52,26,13,40,20,10,5,16,84,2,1\} \\ collatz_i(100) & \begin{bmatrix} "\#" & 100 \\ "N" & 25 \\ "M" & 100 \end{bmatrix} \\ \end{array}$	in_one({1,2,3,4,5,10},{1,2,4,6,7})	{3,5,10,6,7}
$\label{eq:absolution} \begin{split} ∈_both\{\{ab,ac,ad,ae\},\{ae,ab,bc\}\} & \{ab,ae\} \\ ∈_one\{[1\ 2\ 3\ 4\ 5\ 10],[1\ 2\ 4\ 6\ 7]\} & \{3,5,10,6,7\} \\ ∈_one\{\{ab,ac,ad,ae\},[ae\ ab\ bc]\} & \{3,5,10,6,7\} \\ ∈_both\{\{ab,ac,ad,ae\},[ae\ ab\ bc]\} & \{ab,ae\} \\ &collatz_p(10) & \{100,50,25,76,38,19,58,29,88,44,22,11,34,17,52,26,13,40,20,10,5,16,84,2,1\} \\ &collatz_i(100) & \left\{100,50,25,76,38,19,58,29,88,44,22,11,34,17,52,26,13,40,20,10,5,16,84,2,1\} \\ &collatz_i(100) & \left\{100,50,25,76,38,19,58,29,88,44,22,11,34,17,52,26,13,40,20,10,5,16,84,21\} \\ &collatz_i(100) & \left\{100,50,25,76,38,19,58,29,88,44,22,11,34,17,52,26,13,40,20,10,5,16,84,21\} \\ &collatz_i(100) & \left\{100,50,25,76,38,19,58,29,84,21,14,20,10,2$	$in_one(\{ab,ac,ad,ae\},\{ae,ab,bc\})$	$\{ac,ad,bc\}$
$\begin{array}{c} in_one \left[\left[1 \ 2 \ 3 \ 4 \ 5 \ 10 \right], \left[1 \ 2 \ 4 \ 6 \ 7 \right] \right) & \{3,5,10,6,7\} \\ in_both \left\{ ab, ac, ad, ae \}, \left[ae \ ab \ bc \right] \right) & \{ab, ae \} \\ collatz_p(10) & \{10,5,16,8,4,2,1\} \\ collatz_p(100) & \{100,50,25,76,38,19,58,29,88,44,22,11,34,17,52,26,13,40,20,10,5,16,84,2,1\} \\ collatz_i(100) & \left\{ 100,50,25,76,38,19,58,29,88,44,22,11,34,17,52,26,13,40,20,10,5,16,84,2,1 \} \\ collatz_i(100) & \left\{ 100,50,25,76,38,19,58,29,88,44,22,11,34,17,52,26,13,40,20,10,5,16,84,21 \} \\ collatz_i(100) & \left\{ 100,50,25,76,38,19,58,29,88,44,22,11,34,17,52,26,13,40,20,10,5,16,84,21 \} \\ collatz_i(100) & \left\{ 100,50,25,76,38,19,58,29,88,44,22,11,34,17,52,26,13,40,20,10,20 \\ collatz_i(100) & \left\{ 100,50,25,76,38,19,58,29,84,20,10,20 \\ collatz_i(100) & \left\{ 100,50,25,76,38,19,58,20,20 \\ collatz_i(100) & \left\{ 100,50,25,76,38,19,58,20,20 \\ collatz_i(100) & \left\{ 100,50,25,76,38,19,58,20,20 \\ collatz_i(100) & \left\{ 100,50,25,76,38,19,58,20 \\ collatz_i(100) & \left\{ 100,50,25,76,38,19,20 \\ collatz_i(100) & \left\{ 100,50,25,76,38,19,20 \\ collatz_i(100,50,25,19,20,20,20,20,20,20,20,20,20,20,20,20,20,$	$in_both(\{1,2,3,4,5,10\},\{1,2,4,6,7\})$	$\{1,2,4\}$
$\begin{array}{llllllllllllllllllllllllllllllllllll$	$in_both(\{ab,ac,ad,ae\},\{ae,ab,bc\})$	$\{ab, ae\}$
$ \begin{array}{c} collatz_p(10) & \{10,5,16,8,4,2,1\} \\ collatz_p(100) & \{100,50,25,76,38,19,58,29,88,44,22,11,34,17,52,26,13,40,20,10,5,16,8,4,2,1\} \\ collatz_i(100) & \begin{bmatrix} "\#" & 100 \\ "N" & 25 \\ "M" & 100 \end{bmatrix} \\ \end{array} $	in_one([1 2 3 4 5 10],[1 2 4	6 7]) {3,5,10,6,7}
$collatz_p(100) \qquad \{100,50,25,76,38,19,58,29,88,44,22,11,34,17,52,26,13,40,20,10,5,16,8,4,2,1\} \\ collatz_i(100) \qquad \qquad \begin{bmatrix} "\#" & 100 \\ "N" & 25 \\ "M" & 100 \end{bmatrix}$	$in_both(\{ab,ac,ad,ae\},[ae\ ab\ bc])$	$\{ab, ae\}$
$collatz_i(100) \begin{bmatrix} "#" & 100 \\ "N" & 25 \\ "M" & 100 \end{bmatrix}$	$collatz_p(10)$	$\{10,5,16,8,4,2,1\}$
"N" 25 "M" 100	$collats_p(100)$ {100	$0,50,25,76,38,19,58,29,88,44,22,11,34,17,52,26,13,40,20,10,5,16,8,4,2,1 \}$
$collatz_i(seq(k,k,1,100))$	<i>collatz_i</i> (100)	"N" 25
	$collats_i(seq(k,k,1,100))$	
"#" 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 "N" 0 1 7 2 5 8 16 3 19 6 14 9 9 17 17 4 12 20 20 7 7 15 15 10*	" 1 <u>2 5 4 5 6 7 6</u>	

I believe that the first screen is self-explaining. The results of *collatz_i* may serve for a pretty scatter plot.



The next screen shows the Vigenére-Code (see also DNL 39 from 2000). $div_sum(n)$ gives the sum of all divisors of *n*. $next_p(n)$ presents the next prime > *n* or < *n*. $is_pr(n)$ needs some explanation.