Main_9

Notes:

Single digit base 10 integer is 1-9 inclusive.

He won't be able to do very good math with 1 finger.

So we can start with 2.

Nooshem the alien has between 2 and 9 fingers inclusive.

The largest symbol in the calcs is 4 so the the least fingers Nooshem may have is 5.

The symbol 4 is only possible in base 5 and above.

Nooshem *has between 5 and 9 fingers inclusive.*

$33_N + 44_N$

BASE 5

CARRY	1	1	
		3	3
		4	4
ANSWER	1	3	2

$33_5 + 44_5 = 132_5$

BASE 6

CARRY	1	1	
		3	3
		4	4
ANSWER	1	2	1

$33_6 + 44_6 = 121_6$

BASE 7

CARRY	1	1	
		3	3
		4	4
ANSWER	1	1	0

$33_7 + 44_7 = 110_7$

BASE 8

CARRY	0	0	
		3	3
		4	4
ANSWER	0	7	7

$33_8 + 44_8 = 77_7$

BASE 9

CARRY	0	0	
		3	3
		4	4
ANSWER	0	7	7

$33_9 + 44_9 = 77_9$

$23_N + 34_N$

BASE 5

CARRY	1	1	
+		2	3
		3	4
ANSWER	1	1	2

$23_5 + 34_5 = 112_5$

BASE 6

CARRY	1	1	
+		2	3
		3	4
ANSWER	1	0	1

$23_6 + 34_6 = 101_6$

BASE 7

CARRY	0	1	
+		2	3
		3	4
ANSWER	0	6	0

$23_7 + 34_7 = 60_6$

BASE 8

CARRY	0	0	
+		2	3
		3	4
ANSWER	0	5	7

$23_8 + 34_8 = 57_8$

BASE 9

CARRY	0	0	
+		2	3
		3	4
ANSWER	0	5	7

$23_9 + 34_9 = 57_6$

Answer;

We can see from the tables that the only base where the equations $33_N + 44_N$ and $23_N + 34_N$ have a different number of digits is in base 7.

Where $33_7 + 44_7 = 110_7$ (a three digit number) and $23_7 + 34_7 = 57_7$ (a two digit number).

We can conclude now, that Nooshem (the alien) has 7 fingers on his hand.

Good luck to Nooshem in his future arithmatic endeavours!