

# Add to 100

## Example

5	6
1	4

$$\begin{array}{r} 56 \\ + 14 \\ \hline \end{array}$$

$$70$$

$$51 + 64 = 115$$

answer

↓

$$115 + 70 = 185$$

how do we know if our answer will be odd or even?

A quick way to know if our answer will be odd or even is by adding the two to left and the bottom right numbers together.

## Example

2	3
5	7

$$3 + 7 = 10$$

Because  $3 + 7 = 10$

this means that the answer will be even

1	5
3	2

$$5 + 3 = 8$$

this answer will

be odd.

4	2
5	6

$$2 + 6 = 8$$

this answer will

be odd.

$$\begin{array}{r|l} 8 & 1 \\ \hline 1 & 9 \end{array} \quad + \begin{array}{r} 81 \\ 19 \\ 100 \end{array} \quad = \begin{array}{r} 81 \\ 19 \\ 100 \end{array} \quad 200$$

From practicing, the  
are some sequences  
that I found to work:

$$\begin{array}{r|l} 4 & 5 \\ \hline 5 & 5 \end{array} \quad + \begin{array}{r} 45 \\ 55 \\ 100 \end{array} \quad = \begin{array}{r} 45 \\ 55 \\ 100 \end{array} \quad 200$$

the top right hand  
number and the  
bottom left hand  
number need to add to  
an even number as  
200 is also an even  
number.

$$\begin{array}{r|l} 6 & 3 \\ \hline 3 & 7 \end{array} \quad + \begin{array}{r} 63 \\ 37 \\ 100 \end{array} \quad = \begin{array}{r} 63 \\ 37 \\ 100 \end{array} \quad 200$$

$$\begin{array}{r|l} 5 & 4 \\ \hline 4 & 6 \end{array} \quad + \begin{array}{r} 54 \\ 46 \\ 100 \end{array} \quad = \begin{array}{r} 54 \\ 46 \\ 100 \end{array} \quad 200$$

I then found the  
sum of the top row  
needed to equal 9, and  
the sum of the numbers  
in the left hand column  
needed to equal 9.  
Finally the sum of the  
right hand column  
needed to equal 10.

$$\begin{array}{r|l} 7 & 2 \\ \hline 2 & 8 \end{array} \quad + \begin{array}{r} 72 \\ 28 \\ 100 \end{array} \quad = \begin{array}{r} 72 \\ 28 \\ 100 \end{array} \quad 200$$

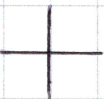
$$\begin{array}{r|l} 3 & 6 \\ \hline 6 & 4 \end{array} \quad + \begin{array}{r} 36 \\ 64 \\ 100 \end{array} \quad = \begin{array}{r} 36 \\ 64 \\ 100 \end{array} \quad 200$$

using this sequence,  
I found 9 ways of  
making 200.

$$\begin{array}{r|l} 2 & 7 \\ \hline 7 & 3 \end{array} \quad + \begin{array}{r} 27 \\ 73 \\ 100 \end{array} \quad = \begin{array}{r} 27 \\ 73 \\ 100 \end{array} \quad 200$$

$$\begin{array}{r|l} 1 & 8 \\ \hline 8 & 2 \end{array} \quad + \begin{array}{r} 18 \\ 82 \\ 100 \end{array} \quad = \begin{array}{r} 18 \\ 82 \\ 100 \end{array} \quad 200$$

$$\begin{array}{r|l} 0 & 9 \\ \hline 9 & 1 \end{array} \quad + \begin{array}{r} 09 \\ 91 \\ 100 \end{array} \quad = \begin{array}{r} 09 \\ 91 \\ 100 \end{array} \quad 200$$



$$\begin{array}{r|l} 0 & 0 \\ \hline 0 & 1 \end{array} + \begin{array}{r} 00 \\ 01 \end{array} = \begin{array}{r} 00 \\ 01 \end{array} = 2$$

$$\begin{array}{r|l} 0 & 0 \\ \hline 0 & 2 \end{array} + \begin{array}{r} 00 \\ 02 \end{array} = \begin{array}{r} 00 \\ 02 \end{array} = 4$$

$$\begin{array}{r|l} 0 & 0 \\ \hline 0 & 3 \end{array} + \begin{array}{r} 00 \\ 03 \end{array} = \begin{array}{r} 00 \\ 03 \end{array} = 6$$

$$\begin{array}{r|l} 0 & 0 \\ \hline 0 & 4 \end{array} + \begin{array}{r} 00 \\ 04 \end{array} = \begin{array}{r} 00 \\ 04 \end{array} = 8$$

$$\begin{array}{r|l} 0 & 0 \\ \hline 0 & 5 \end{array} + \begin{array}{r} 00 \\ 05 \end{array} = \begin{array}{r} 00 \\ 05 \end{array} = 10$$

$$\begin{array}{r|l} 0 & 1 \\ \hline 0 & 0 \end{array} + \begin{array}{r} 01 \\ 00 \end{array} = \begin{array}{r} 00 \\ 10 \end{array} = 11$$

$$\begin{array}{r|l} 0 & 0 \\ \hline 0 & 6 \end{array} + \begin{array}{r} 00 \\ 06 \end{array} = \begin{array}{r} 00 \\ 06 \end{array} = 12$$

$$\begin{array}{r|l} 0 & 1 \\ \hline 0 & 1 \end{array} + \begin{array}{r} 01 \\ 01 \end{array} = \begin{array}{r} 00 \\ 11 \end{array} = 13$$

$$\begin{array}{r|l} 0 & 0 \\ \hline 0 & 7 \end{array} + \begin{array}{r} 00 \\ 07 \end{array} = \begin{array}{r} 00 \\ 07 \end{array} = 14$$

$$\begin{array}{r|l} 0 & 1 \\ \hline 0 & 2 \end{array} + \begin{array}{r} 01 \\ 02 \end{array} = \begin{array}{r} 00 \\ 12 \end{array} = 15$$

I worked sequences using the lowest numbers, starting 00+01 and increasing by 1 each time.

From following this sequence I found that the only sums that could not be made were 1, 3, 5, 7 and 9

$$\begin{array}{r|l} 0 & 0 \\ \hline 0 & 8 \end{array}$$

$$\begin{array}{r} 00 \\ 08 + \\ \hline 8 \end{array} \quad \begin{array}{r} 00 \\ 08 \\ \hline 16 \end{array}$$

$$\begin{array}{r|l} 0 & 1 \\ \hline 0 & 3 \end{array}$$

$$\begin{array}{r} 01 \\ 03 + \\ \hline 4 \end{array} \quad \begin{array}{r} 00 \\ 13 \\ \hline 13 = 17 \end{array}$$

$$\begin{array}{r|l} 0 & 0 \\ \hline 0 & 9 \end{array}$$

$$\begin{array}{r} 00 \\ 09 + \\ \hline 9 \end{array} \quad \begin{array}{r} 00 \\ 09 \\ \hline 9 = 18 \end{array}$$

$$\begin{array}{r|l} 0 & 1 \\ \hline 0 & 4 \end{array}$$

$$\begin{array}{r} 01 \\ 04 + \\ \hline 5 \end{array} \quad \begin{array}{r} 00 \\ 14 \\ \hline 14 = 19 \end{array}$$