

THIRD TUTORIAL ASSIGNMENT

DATE TO DISCUSS: NOV 19 (TUT 1), NOV 26 (TUT 2), DEC 3 (TUT 1), JAN 7 (TUT 2) DUE IN CLASS :
JAN 7 (TUT 1), JAN 14 (TUT 2)

When you complete the problem below, please follow the guidelines discussed on the web page for the class. Your solution need not be long, but it should be neat, clear and grammatically correct.

If you put the integers in a rectangular array as follows:

\vdots	\vdots	\vdots	\vdots	\vdots	\vdots	
36	35	34	33	32	31	...
25	24	23	22	21	30	...
16	15	14	13	20	29	...
9	8	7	12	19	28	...
4	3	6	11	18	27	...
1	2	5	10	17	26	...

Every integer in this array has a pair of integer coordinates describing its location. For instance, say that 1 is at position $(1, 1)$, 2 is at position $(2, 1)$, 3 is at position $(2, 2)$, 4 is at position $(1, 2)$, etc.

It is quite reasonable to find the position of where each integer is up to around 100 by filling in more of the square, but beyond that it becomes burdensome to find that position just by filling in a table and locating that integer. Which integers fall in the first row? first column? the main diagonal? Which integers fall in the k^{th} row? k^{th} column?

Find the location of 10, 312 in this table. How do you find the location of any particular integer in general?

If you can, find a formula for the location of the integer $n > 0$ in the table. Be sure to explain any notation in your solution clearly so that anyone that picks up your paper can understand how to find the location of any integer.