



adjacent grid squares



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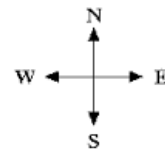
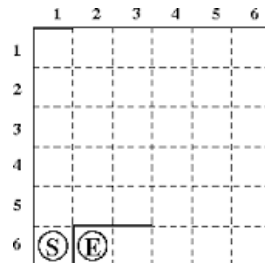
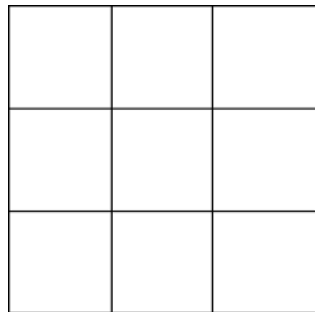
minesweeper

connected

vertices

router

cafe

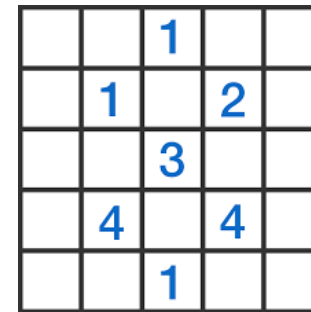


Puzzle Point: Castle

Minesweeper - Solving this puzzle gives you ONE Grid Reference

In the game of Minesweeper the numbers in each square show how many mines lie in adjacent squares (i.e. squares which are adjacent horizontally, vertically or diagonally to that numbered square). For the grid reference you need, find the only blank square which is NOT a mine, and mark on your answer grid.

	1	2	3	4	5	6	7	8	9	10
A	1	2	1	1	1	1	1	1	1	1
B	2	2	2	2	2	2	2	2	2	1
C	1	2	1	2	1	1	1	1	1	1
D	1	1	2	3	1	1	1	1	1	1
E	1	1	2	1	1	1	1	1	1	1
F	1	1	2	1	1	1	1	1	1	1
G	0	1	2	1	1	1	1	1	1	1
H	0	1	1	1	1	1	1	1	1	1
I	0	1	1	1	1	1	1	1	1	1
J	0	0	1	1	1	1	1	1	1	1



Non-adjacent Square	Adjacent Square	Non-adjacent Square
Adjacent Square	Square	Adjacent Square
Non-adjacent Square	Adjacent Square	Non-adjacent Square

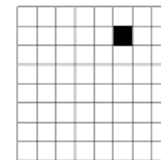
			$\frac{17-24}{2} = \pi$		
	$\frac{4-1}{\pi} = \frac{1}{2}$	$2 - \frac{4}{\pi}$	$\frac{4-1}{\pi} = \frac{1}{2}$		
$\frac{17-24}{2} = \pi$	$\frac{4-1}{\pi} = \frac{1}{2}$	$2 - \frac{4}{\pi}$	$\frac{4-1}{\pi} = \frac{1}{2}$	$\frac{17-24}{2} = \pi$	
	$\frac{4-1}{\pi} = \frac{1}{2}$	$2 - \frac{4}{\pi}$	$\frac{4-1}{\pi} = \frac{1}{2}$	$\frac{4-1}{\pi} = \frac{1}{2}$	
	$\frac{4-1}{\pi} = \frac{1}{2}$	$2 - \frac{4}{\pi}$	$\frac{4-1}{\pi} = \frac{1}{2}$	$\frac{4-1}{\pi} = \frac{1}{2}$	
			$\frac{17-24}{2} = \pi$		

PUZZLE 1

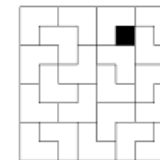
PUZZLE 2



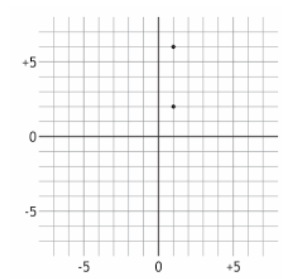
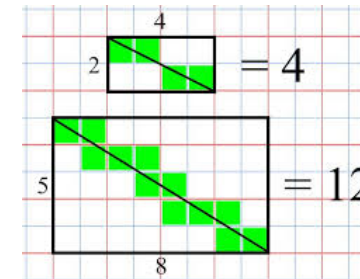
Jigsaw shape



Jigsaw puzzle



A solution

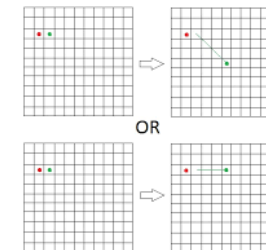


				0			
			$2a_1$	1	$2a_1$		
			$2a_2$	$-1+4a_1$	$4-4a_1$	$-1+4a_1$	$2a_2$
	$2a_3$	$1-4a_1+4a_2$	$-8+18a_1-2a_2$	$17-24a_1$	$-8+18a_1-2a_2$	$1-4a_1+4a_2$	$2a_3$
$2a_4$	$-1+4a_1-4a_2+4a_3$	$12-34a_1+16a_2-2a_3$	$-49+96a_1-12a_2$	$80-128a_1+4a_2$	$-49+96a_1-12a_2$	$12-34a_1+16a_2-2a_3$	$-1+4a_1-4a_2+4a_3$



PUZZLE 3

PUZZLE 4



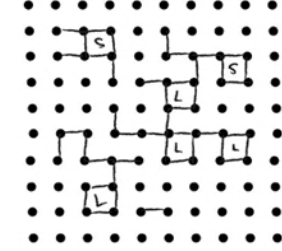
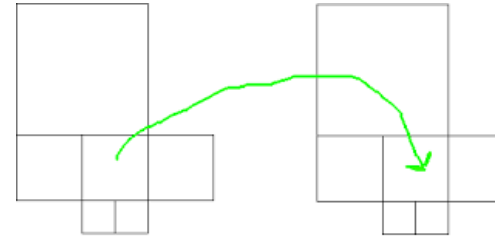
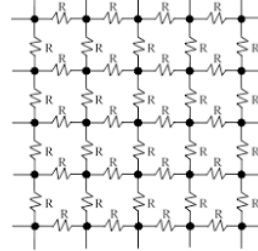
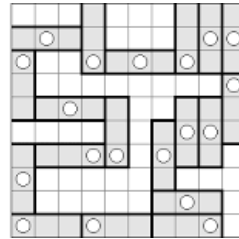
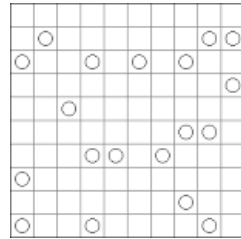
• ME
• TARGET



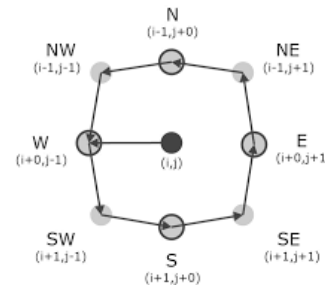
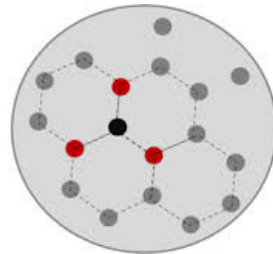
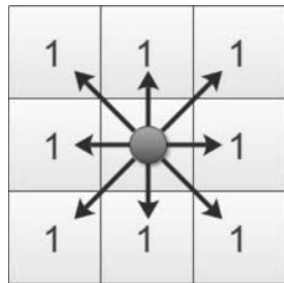
15. Consider a puzzle consisting of fifteen numbered squares placed in a 4×4 grid, as shown below left. A move consists of sliding a numbered square into the adjacent unoccupied square.

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	

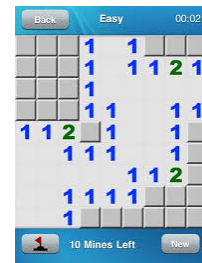
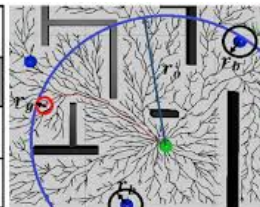
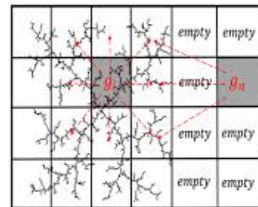
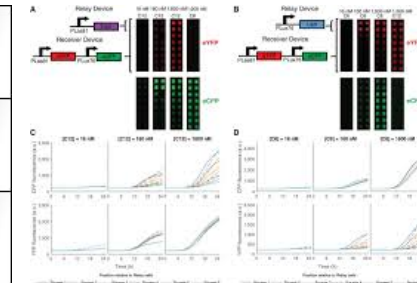
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	



- (a) If we treat the unoccupied square as numbered 16, every configuration corresponds to a permutation in S_{16} . For example, the configuration above left corresponds to the identity, while the configuration above right corresponds to the transposition $(14\ 15)$. Show that applying a move to a configuration corresponds to imposing the corresponding permutation with a transposition.
- (b) Prove that if the unoccupied square starts and ends in the bottom-right corner, then an even number of moves must have occurred.
(Hint: Show that the unoccupied square moved up the same number of times that it moved down.)
- (c) Hence, deduce that it is impossible to start with the configuration above left and end up with the configuration above right, where the squares numbered 14 and 15 are swapped.

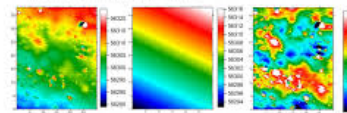


0,2	1,2	2,2
0,1	1,1	2,1
0,0	1,0	2,0



Processing and interpreting total field magnetic data, Kevin Rin, Montana

- Collected three adjacent grids
- Grid #3, used for organization-fil in details later
- Removing a least squares best-fit regional plane isolates local anomalies of interest and allows merging of our datasets



Raw data (left) contains Earth's ambient magnetic field represented by the plane in the center image. Thus, we subtract that plane.

The image on the right is the local field which includes convection correlated with acquisition as well as signals of interest.

