Day 6: Pathway Problems

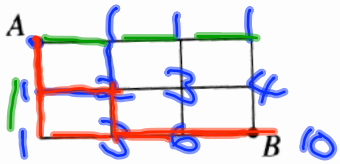
1
1 1
1 2 1
1 3 3 1

**Video

Down / right

Consider the following problem:

"Find the number of pathways from *A* to *B* if paths must always move closer to *B*"



This problem can be solved in several ways.

a) Solve this problem by tracing the number of paths on the grid.

b) Explain how this problem can be regarded as an example of permutations with repetitions. Determine the number of pathways using this approach.

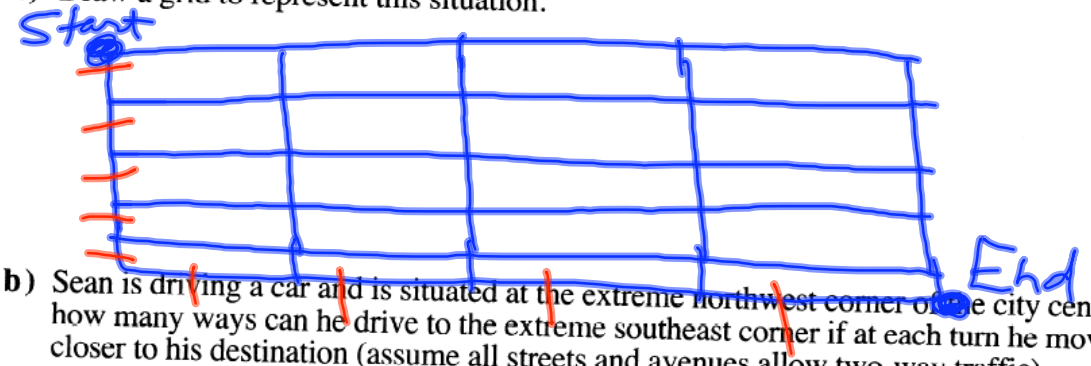
c) Explain how this problem can be regarded as an example of combinations. Use the combination formula or Pascal's Triangle to determine the number of pathways

$_5C_2 = 10$

$_5C_3 = 10$

A city centre has a rectangular road system with 5 streets running north to south and 6 avenues running west to east.

a) Draw a grid to represent this situation.

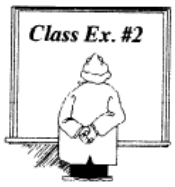


b) Sean is driving a car and is situated at the extreme northwest corner of the city centre. In how many ways can he drive to the extreme southeast corner if at each turn he moves closer to his destination (assume all streets and avenues allow two-way traffic).

$_9C_5$

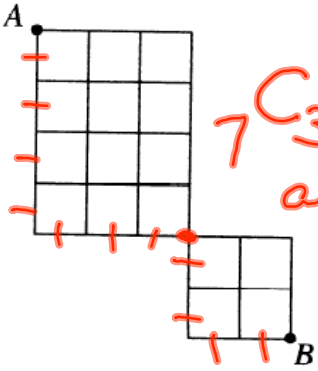
or $= 126$

$_9C_4$



Find the number of pathways from A to B if paths must always move closer to B.

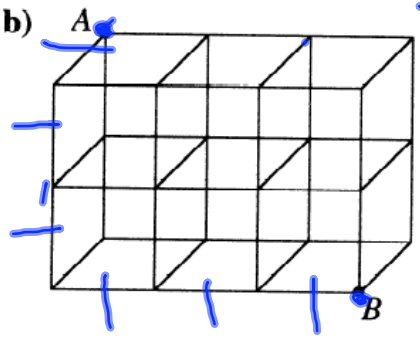
a) A



$_7C_3$ and $_4C_2$

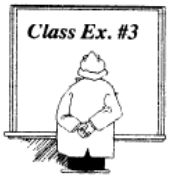
210

b) A



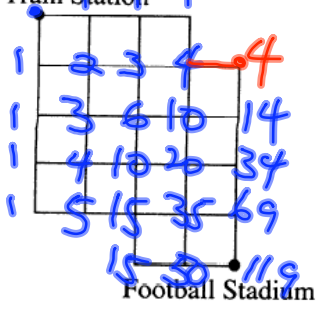
$$\frac{6!}{2! \cdot 3!}$$

60

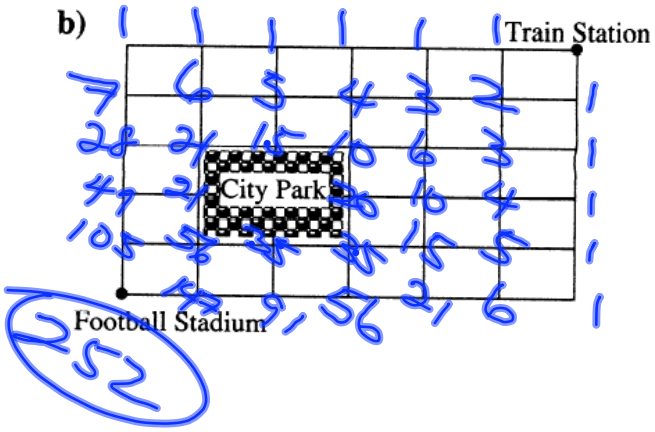


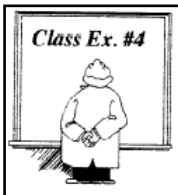
A taxi company is trying to find the quickest route during rush hour traffic from the train station to the football stadium. How many different routes must must be considered if at ea intersection the taxi must always move closer to the football stadium?

a) Train Station

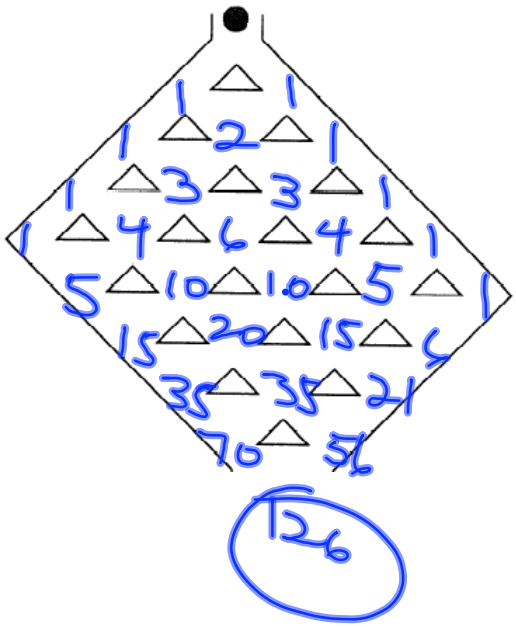


b)





How many different paths can a pinball take as it falls from top to bottom?



Assignment Handout