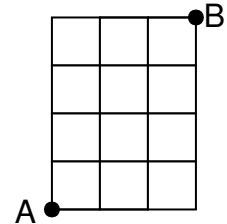


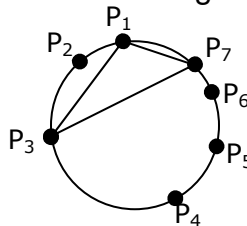
## Representation with Combinatorics

1. \_\_\_\_\_ How many three-element subsets does the set  $\{A, B, C, D, E, F, G\}$  have?
2. \_\_\_\_\_ How many different ways can a three-person committee be formed from the members of a seven-member club?

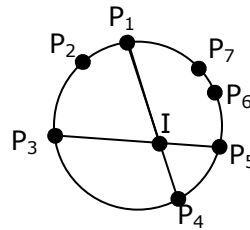
3. \_\_\_\_\_ Each small square has sides of length 1 unit. How many paths of length seven units are there from A to B in the grid to the right?



4. \_\_\_\_\_ Let  $P_1, P_2, P_3, P_4, P_5, P_6$  and  $P_7$  be seven different points on a circle. How many different triangles can be formed using these given points as vertices?



5. \_\_\_\_\_ Seven points are distributed around a circle. All possible chords, using the given seven points as endpoints, are drawn. What is the greatest possible number of points of intersection inside the circle? The point I is an example of one such point.



6. \_\_\_\_\_ How many solutions are there to  $a + b + c + d = 4$ , where  $a, b, c$  and  $d$  are non-negative integers? For example  $(2, 1, 0, 1)$  is such a solution.
7. \_\_\_\_\_ How many solutions are there to  $a + b + c + d = 8$ , subject to the condition that each of the variables is a positive integer?
8. \_\_\_\_\_ What is the coefficient of  $X^3$  in the expanded form of  $(X+1)^7$  ?

9. \_\_\_\_\_ What is the value of  $\frac{7!}{(7-3)!3!}$  ?

10. \_\_\_\_\_ What is the fourth entry of the eighth row of Pascal's triangle shown below?

			1			
			1	1		
		1	2	1		
	1	3	3	1		
1	4	6	4	1		