# Hybleland L9-Lesson 04 Combination 2-Assignment

**Practice 1.** Five distinct circles are drawn in a plane. What is the maximum number of points where at least two of the circles intersect?

$(A)18$ $(B)19$ $(C)20$ $(D)22$ $(E)26$

**Practice 2.** Ten distinct circles are drawn in a plane. What is the maximum number of points where at least two of the circles intersect?

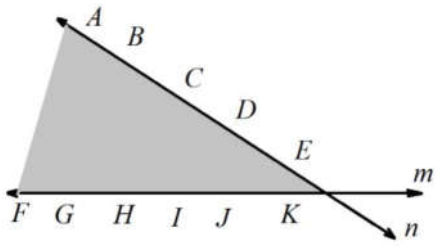
$(A)90$ $(B)45$ $(C)80$ $(D)82$ $(E)86$

**Practice 3.** Three distinct circles and four straight lines are draw in a plane. What is the maximum number of points of intersection?

$(A)12$ $(B)24$ $(C)30$ $(D)36$ $(E)48$

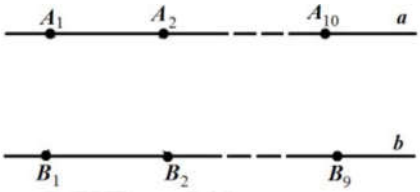
**Practice 4.** Five distinct points on line n(A,B,C,D,E) and six distinct points on line m(F,G,H,I,J,K) are chosen to maximize the number of intersections in the shaded region among the 30 unique line segments connecting one of the four points on n to one of the five points on m. Find the maximum number of intersections in the shaded region, excluding the intersections at points on lines m or n.

$(A)120$ $(B)132$ $(C)150$ $(D)167$ $(E)180$



**Practice 5.** As shown in the figure, line a is parallel to line b. There are 10 points on line a and none points on line b. If we connect each point on a with each point on b, we get many lines. If no three of these line intersects at one point, what is the number of intersection points between a and b?

$(A)1520$ $(B)1620$ $(C)1650$ $(D)1670$ $(E)1800$

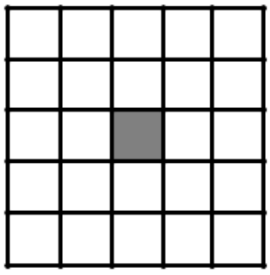



**Practice 6.** Lines $L_1, L_2, \ldots L_{200}$ are distinct. All lines $L_{4n}$, n a positive integer, are parallel to each other. All lines $L_{4n-3}$, n a positive integer, pass through a given point A . The maximum number of points of intersection of pairs of lines from the complete set $\{L_1, L_2, \ldots L_{50}\}$ is

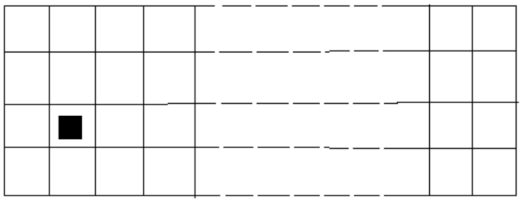
$(A)1024$ $(B)1082$ $(C)1100$ $(D)1200$ $(E)1030$

**Practice 7.** The 5×5 grid shown contains a collection of rectangles. How many of these rectangles contain the black center square?

$(A)12$ $(B)15$ $(C)17$ $(D)81$ $(E)20$



**Practice 8.** The 4×16 rectangular grid of squares shown below contains a shaded square. How many rectangular sub-regions contain the shaded square?



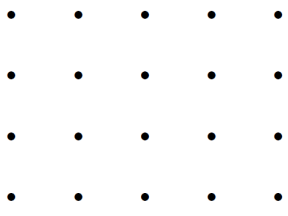
$(A)120$ $(B)150$ $(C)170$ $(D)180$ $(E)190$

**Practice 9.** A set of four points is chosen randomly from the grid shown. Each four point set has the same probability of being chosen. What is the probability that the points form a square?

$(A)1/21$ $(B)1/14$ $(C)2/21$ $(D)1/7$ $(E)2/7$

**Practice 10.** Twenty lattice points are arrnaged along the edges of a 4×3 rectangle as shown. How many triangles have all three of their vertices among these points?

$(A)1056$ $(B)1052$ $(C)1036$ $(D)1032$ $(E)1012$

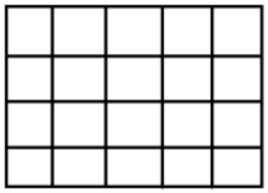


**Practice 11.** Find the number of triangles whose vertices are lattice points in the xy-plane satisfying $1 \le x \le 5$ and $1 \le y \le 5$.

$(A)1650$ $(B)2200$ $(C)2270$ $(D)2148$ $(E)2160$

**Practice 12.** A set of 20 square blocks is arrnaged into a 4×5 rectangle. How many different combinations of 2 blocks can be selected from that set so that the 2 blocks do not share a common side?

$(A)100$ $(B)125$ $(C)159$ $(D)155$ $(E)160$



**Practice 13.**

AMC10B 2002 / Problem 18

Four distinct circles are drawn in a plane. What is the maximum number of points where at least two of the circles intersect?

A. 8 B. 9 C. 10 D. 12 E. 16

**Practice 14.**

UKMT-IMC 2009 / Problem 21

There are lots of ways of choosing three dots from this 4 by 4 array. How many triples of points are there where all three lie on a straight line (not necessarily equally spaced)?

A. 8 B. 16 C. 20 D. 40 E. 44

**Challenge-Practice 15.** (2005, AIME, Problem 5)
Robert has 4 indistinguishable gold coins and 4 indistinguishable silver coins.
Each coin has an engraving of a face on one side, but not on the other.
He wants to stack the eight coins on a table into a single stack so that no two adjacent coins are face to face.
Find the number of possible distinguishable arrangements of the 8 coins.