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MIDTERM 1
TAKE HOME

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N : _____
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I have neither given aid to nor received aid from a fellow student.

Signature: _____

Question 1.

(10 points) Twenty-five points, no three collinear, are given in the plane. How many straight lines do they determine? How many triangles do they determine?

Question 2.

(10 points) How many possibilities are there for the placement of 8 identical non-attacking rooks on an 8-by-8 chessboard? (*Two rooks can attack one another if and only if they are in the same row or the same column of the chessboard.*)

Question 3.

(10 points) Prove by induction that for any positive integer n and for all x and y

$$(x + y)^n = \sum_{k=0}^n \binom{n}{k} x^k y^{n-k}.$$