Math 374 **Name:**_____
Quiz 6

(1) A bank has 214 customers. 189 of them have checking accounts, 73 have normal savings accounts, and 114 have money market savings accounts. 69 customers have checking accounts and normal savings accounts. No customer is allowed to have a normal savings account and a money market savings account.
   (a) How many customers have checking accounts and money market savings accounts?

   (b) How many customers have a checking account, but no savings account at all?

(2) How many numbers must be selected from the set $\{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}$ to guarantee the at least one pair adds up to 22?

(3) The following two problems concern a square grid of size n. Think of it as being in the first quadrant of the plane, and the intersection points are at integer paired points.

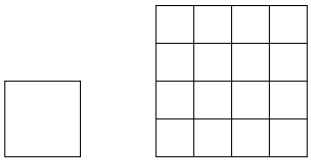

FIGURE 1. A 1×1 grid, and a 4×4 grid.

A particle starts at the bottom left corner (0,0), and travels to the top right corner (n, n). It can only make moves of exactly one unit to the right or up, and cannot leave the grid.

(a) How many different paths can the particle take in an $n \times n$ grid? (Hint: How many steps does it take?)

(b) How many paths can the particle take that pass through the point $(4, 4)$ in a 10×10 grid?

(4) There are 6 people in a wedding party. How many ways can they be lined up, if the bride and groom are not allowed to stand next to each other?

(5) What is the exponent of $x^5y^3z^2$ in $(x - y + 2z)^{10}$? (Hint: Use the binomial theorem twice, the first time with $x - y$ as a single term.)