Physics 207/201  
Honors Lecture  
HW #1  
Due Friday September 11, 2009

The Binomial Distribution

1.) Using Excel or any other plotting software you like, make a plot of the binomial probability distribution that we derived in the first honors lecture:

\[ P_N(m) = \binom{N}{m} \left( \frac{1}{2} \right)^N \]

for three cases: \( N = 10, \ N = 20, \text{ and } N = 30. \) Put them on one plot so it’s easy to compare them. As a guide, the case of \( N = 20 \) is shown below. Notice that \( m \) is an even number and ranges from \(-N\) to \(+N\).

2.) Measure (with a ruler) on your plots from part 1 the ‘half-width at half maximum’ (HWHM) of each distribution and verify that the HWHM is proportional to \( N^{1/2} \).