(1-3) Let \( p(x,y) = \begin{cases} 
\frac{3}{2} x + 3y & \text{if } 0 \leq x \leq 1 \text{ and } 0 \leq y \leq x \\
0 & \text{elsewhere}
\end{cases} \) be a joint density function.

1. Find the probability that \( \frac{1}{2} \leq x \leq 1 \text{ and } 0 \leq y \leq \frac{1}{2} \).

2. Find the probability that \( \frac{1}{2} \leq x \leq 1 \text{ and } 0 \leq y \leq x \).

3. Find the probability that \( 0 \leq y \leq \frac{1}{2} \text{ and } y \leq x \leq \frac{1}{2} \).

4. If \( p(x) \) is a normal distribution with \( \mu = 0 \) and \( \sigma = 1 \) and if \( q(y) \) is another normal distribution with \( \mu = 0 \) and \( \sigma = 1 \), then find the probability that \( -1 \leq x \leq 1 \text{ and } -1 \leq y \leq 1 \). Set up a double integral and use \texttt{fnInt} on your TI-83/84 calculator to approximate numerically rounding to the nearest hundredth.

5. If the weights of adult men are normally distributed with a mean of 200 pounds and a standard deviation of 10 pounds, and if IQ is normally distributed with a mean of 100 and a standard deviation of 15 points, then what is the probability that an adult male has a weight between 200 and 210 pounds and an IQ between 100 and 120? Let \( x \) equal weight and \( y \) equal IQ, set up a double integral, and use \texttt{fnInt} on your TI-83/84 calculator to approximate numerically rounding to the nearest hundredth.