Midterm Test 1 Retake

1. 2.On a rectangular target with sides of one meter lengths each a circle is drawn with radius of 0.5 meter. Find the probability that a random shot (given it hits the target) hits the target outside the circle.   **[4 points]**
2. In a box we have 8 cards numbered from 1 to 8. A card is chosen randomly. Let events A, B and C denote the following:
    a. A: the chosen number is even;
    b. B: the chosen number is not greater than 4;
    c. C: the chosen number is either 2 or greater than 5.
    Show that $P(ABC) = P(A)P(B)P(C)$and the three events are not mutually independent.   **[5 points]**
3. Two lottery coupons (5 from 90) are filled independently of each other. What is the probability of winning, i.e. of hitting at least two winning numbers?   **[5 points]**
4. Rust Rider cars are produced in four factories. The first factory produces 200 cars per day, the second 320, the third 270, while the fourth 210. The refuse ratios for the factories are 2%; 5%; 3% and 1%, respectively. We bought a Rust Rider and we found it perfect. What is the probability that it had been produced in the fourth factory?   **[6 points]**
5. Write down the definition and formula of conditional probability!   **[10 points]**
6. Write down the definition and formula of Expected value!   **[10 points]**