Math 530

Autumn 2006

Quiz 1

Instructions: This quiz is worth a total of 20 points with the point value of each question is listed with each question. You may use any notes or books but you must work individually. Make sure to write clearly and justify your answers.

(1.)(3 pts.) A box has 10 balls numbered $1, 2, \ldots, 10$. Two balls are picked at random. What is the probability that the numbers on the two balls differ by two or more?

(2.)(5 pts.) A box has 10 balls, 6 of which are black and 4 of which are white. Four balls are removed, one at a time.

(a.) What is the probability that the last ball removed is white?

(b.) What is the probability that the last ball removed is black?

(3.)(8 pts.) An 20-sided die is rolled three times.

(a.) What is the probability that the sum of the three rolls is less than 6?

(b.) What is the probability that the sum of the three rolls is exactly 6?

(c.) What is the probability that the sum of the three rolls is greater than 6?

(4.)(4 pts.) Find the following:

(a.) Suppose A and B are events such that $P(A) = \frac{2}{5}, P(B) = \frac{2}{5}$ and $P(A \cup B) = \frac{1}{3}$, find $P(A \cap B)$.

(b.) Suppose C and D are events such that $P(C) = \frac{1}{3}, P(C \cup D) = \frac{1}{2}$ and $P(C \cap D) = \frac{1}{4}$, find $P(D)$.