

Math 110**Quiz 6****Summer 2007**

Justify all answers with neat and organized work. Clearly indicate your answers.
25 points possible.

$${}_nP_r = \frac{n!}{(n-r)!} \quad {}_nC_r = \frac{n!}{(n-r)!r!}$$

$$P(\text{not } E) = 1 - P(E)$$

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(A \text{ and } B) = P(A) \cdot P(B) \quad (A, B \text{ independent})$$

A standard deck of cards has 52 cards.

There are 4 suits: spades, hearts, diamonds, clubs.

There are 13 ranks in each suit: Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen, King.

The Jack, Queen, and King are called picture cards, or face cards.

The spades and clubs are black.

The hearts and diamonds are red.

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1. (3 pts.) From a club of 15 people, in how many ways can a group of four members be selected to attend a conference?
 2. (3 pts.) An election ballot asks voters to select three city commissioners from a group of eight candidates. In how many ways can this be done?
 3. (3 pts.) You volunteer to help drive children at a charity event to the zoo, but you can fit only 6 of the 14 children present in your van. How many different groups of 6 children can you drive?
 4. (2 pts.) An ordinary fair die is rolled. Find the probability of rolling a 4.
 5. (3 pts.) You are dealt one card from a standard 52-card deck. Find the probability of being dealt a picture card.
 6. (2 pts.) You select a family with three children. If M represents a male child and F a female child, the set of equally-likely outcomes for the children's genders is $\{MMM, MMF, MFM, MFF, FMM, FMF, FFM, FFF\}$. Find the probability of selecting a family with exactly two male children.
 7. (3 pts.) The mathematics department of a college has 7 male professors, 10 female professors, 13 male teaching assistants, and 6 female teaching assistants. If a person is selected at random from the group, find the probability that the selected person is a teaching assistant or a female.
 8. (3 pts.) A single die is rolled twice. Find the probability of rolling an even number the first time and a number greater than 4 the second time.
 9. (3 pts.) There are 30 chocolates in a box, all identically shaped. Five are filled with coconut, 10 with caramel, and 15 are solid chocolate. You randomly select one piece, eat it, and then select a second piece. Find the probability of selecting a solid chocolate followed by a caramel-filled chocolate.