

MATH 2050
Quiz (Probability)

NAME _____

Be neat. Be clear. Use a pencil. Show all pertinent work.

1. Randomly draw one card from a well-shuffled deck of playing cards.
Let H = event card is a heart, F = event card is a face card, and R = event card is red.
Find the following probabilities.

(i) $P(F \cap R)$

answer: _____

(ii) $P(F \cup R)$

answer: _____

(iii) $P(F | H)$

answer: _____

(iv) $P(H \cap R)$

answer: _____

2. Roll a pair of fair dice.

(i) What is the probability that the sum of upturned faces equals 7?

answer: _____

(ii) What is the probability that both upturned faces have equal value?

answer: _____

(iii) What is the probability that the sum of upturned faces is a prime number?

answer: _____

3. Four fair dice are rolled. Find the probability that the sum of the upturned faces is 18.

answer: _____

4. If a family has 10 children, what is the probability that exactly four children are girls?
(Assume the probability that a newborn is a girl equals $1/2$. Use the binomial distribution.)

answer: _____

5. A shipment of 100 widgets contains 10 defective widgets. If a random sample of 25 widgets is obtained from the shipment, what is the probability that the sample will contain at least one defective widget?

answer:_____

6. Draw three cards without replacement from a well-shuffled deck of playing cards.

(i) What is the probability that none of the cards is a face card?

answer:_____

(ii) What is the probability of getting "three-of-a-kind"?

answer:_____

7. The probability that a person will get a cold this year is 0.7. If 10 people are selected at random, what is the probability that at least 2 of the 10 people will get a cold this year? (Binomial.)

answer:_____

8. Two percent of a large population is afflicted with "condition X". A diagnostic test for condition X has a false positive rate of 4% and a false negative rate of 6%. If the whole population is given the diagnostic test, what proportion of those who test positive actually have condition X?

answer:_____

9. A student randomly guesses at 20 multiple-choice questions that comprise a test. Each question has 5 possible choices. Find the probability that the student fails the test, that is, gets less than 12 correct.

answer:_____

10. Five cards are dealt from a well-shuffled deck of playing cards. Find the probability of getting "4-of-a-kind"?

answer:_____