

You MUST use good notation and show appropriate work.

Math 102
(Section 14.1 & 14.2)

Name _____

1. Consider the following: “Three children are born to a family and the order of the births with respect to gender are noted.”
- a) Write out the sample space for this “experiment” [One possible outcome is BBG (meaning the oldest child is a boy, the middle child is a boy, and the youngest child is a girl.)]
- b) Write out, using proper set notation, each of the following events.
- i) A is the event of having more girls than boys.
- ii) B is the event that exactly two children are boys.
- iii) C is the event that all children are of the same gender.
- iv) D is the event that the oldest child is a girl and the youngest child is a boy.
- c) Using the events defined in part b) and assuming births of boys and girls to be equally likely, determine each of the following probabilities. (In parts v and vi, first determine events $A \cap D$ and B' .)

i) $P(A) =$ _____

ii) $P(B) =$ _____

iii) $P(C) =$ _____

iv) $P(D) =$ _____

v) $P(A \cap D) =$ _____

vi) $P(B') =$ _____

2. If a nickel, a dime, and a quarter are tossed, find the probability of obtaining

- a) no heads a) _____
- b) at least one head b) _____
- c) exactly 2 heads c) _____

3. Assume an urn contains 5 white chips and 10 black chips.

- a) If you draw 1 chip randomly from the urn, determine the probability that the chip
 - i) is white i) _____
 - ii) is not white ii) _____
- b) If 5 chips are drawn, all at one time (without replacement), determine the probability that
 - i) exactly 2 are white and 3 are black i) _____
 - ii) all 5 drawn chips are black ii) _____

4. Suppose you roll a die and note the dots that show. Let A be the event “that the number of dots showing is a multiple of 3”.

- i) Calculate the **odds against** event A . i) _____
- ii) Calculate $P(A)$ ii) _____

5. If the probability that you will win a door prize at a certain event is $\frac{3}{100}$, what is the probability that you will not win a door prize?

6. Assume you draw one card from a standard deck of cards. Let H be the event of drawing a heart and J be the event of drawing a “jack”. Calculate each of the following probabilities.

- a) $P(H) =$ a) _____
- b) $P(J) =$ b) _____
- c) $P(H \cap J) =$ c) _____
- d) $P(H \cup J) =$ d) _____
- e) Does $P(H \cup J) = P(H) + P(J)$? Why or why not?