

Lab for Sections 14.1 & 14.2

Use good notation and show appropriate work.
State your solutions to problems in complete sentences.

Name _____

1. Consider the following: “Three children are born to a family where the order of the births with respect to gender is noted.”
 - (a) Write out a sample space where one 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.
 - (i) $P(A)$
 - (ii) $P(B)$
 - (iii) $P(C)$
 - (iv) $P(D)$
 - (v) $P(A \cap D)$
 - (vi) $P(B')$
2. Assume you draw one card from a standard deck of cards. Determine the probability that you draw
 - (a) a heart
 - (b) an ace
 - (c) an ace or a heart
 - (d) the ace of hearts
 - (e) What are the odds against drawing a heart?
 - (f) What are the odds in favor of drawing an ace?

3. 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?
4. 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) $P(H)$ (b) $P(J)$
- (c) $P(H \cap J)$ (d) $P(H \cup J)$
- (e) Does $P(H \cup J) = P(H) + P(J)$? Why or why not?
5. Assume A and B are events in S such that $P(A) = 0.6$, $P(B) = 0.5$ and $P(A \cap B) = 0.3$. Use a probability Venn Diagram (and other properties of probability) to determine each of the following.
- (a) $P(A') =$ (b) $P(A \cup B) =$
- (c) $P(S) =$ (d) $P(A - B) =$
- (e) $P(A' \cup B') =$ (f) $P((A \cap B)') =$
6. Use a standard 52-card deck for this problem.
- (a) What is the probability of being dealt a flush poker hand? *To simplify the problem consider royal and straight flushes as flushes.*
- (b) What are the odds in against of drawing a flush poker hand?
- (c) What is the probability of not drawing a flush poker hand?