

Math 1332: Worksheet 7

November 17, 2021

Name: _____

1. You are playing Dungeons and Dragons, and you want to calculate some probabilities involved with the game. All dice are numbered from 1 up to the number of sides on the die.
 - (a) To determine whether your elf barbarian can successfully attack the dragon with her greataxe, you roll a 20-sided die, add your attack modifier and succeed if the total is \geq the dragon's armor class (AC). If your attack modifier is +8 and the dragon's AC is 17, what is the probability your barbarian successfully attacks the dragon?
 - (b) Your elf barbarian can make two independent attacks each turn. If both attacks are directed at the dragon, what is the probability at least one attack is successful? The probability that both attacks are successful?
 - (c) Suppose exactly one attack is a success. To determine damage for an attack, you roll one 12-sided die and add a damage modifier of +5. What is the probability your barbarian's attack does at least 15 damage to the dragon?

2. You are looking at events in a sample space. You know that the events A , B , and C are independent, and that they have the following probabilities:

event	A	B	C
probability	$1/2$	$2/3$	$3/5$

- (a) Determine $P(A \text{ and } B)$, $P(A \text{ and } C)$, and $P(B \text{ and } C)$.
- (b) Determine $P(A \text{ or } B)$, $P(A \text{ or } C)$, and $P(B \text{ or } C)$.
- (c) Determine $P(A \text{ and } B \text{ and } C)$.
- (d) Determine $P(A \text{ and } B \text{ but not } C)$.