

Evo 21 Exercise Solutions

1. Suppose that you have just landed at position 19 on the Evo board.
 - What is the probability that you will get 21 on the next roll of the dice? *(You would have to roll a sum of two. The probability for this happening is $1/36$. Pretty risky!)*
 - What is the probability that you will bust on the next roll of the dice? *(You will bust if you roll anything higher than a sum of two. The probability of this happening is $35/36$. Pretty likely!)*
2. Suppose that you have just landed at position 20 on the Evo board.
 - What is the probability that you will get 21 on the next roll of the dice? *(The probability is zero, as you would need to roll a 1, which is impossible with a pair of dice.)*
 - What is the only sensible strategy for you at this point? *(Hold at 20 and keep your fingers crossed that your opponents don't get 21!)*
3. Suppose that you have just landed a position 17 on the Evo board.
 - In the event that you decide to roll again, what is the probability that you will still be in the game after your next roll? *(You would have to roll 2, 3, or 4. The probability for this is $(1+2+3)/36 = 6/36$, or 1 in 6. Kind of iffy!)*
 - In the event that you decide to roll again, what is the probability that you get 21 on your next roll? *(You would have to roll a sum of 4. The probability of this is $3/36$ or 1 in 12. Good luck!)*
4. You and a good friend of yours are playing Evo 21. You have just finished your turn, deciding to hold at 19. Your friend has just landed at position 14.
 - Assuming that your friend elects to continue playing and not hold, what is the probability that he and you are tied after his next roll? *(He would have to roll a sum of 5. The probability of this is $4/36 = 1/9$.*
 - Assuming that your friend elects to continue playing and not hold, what is the probability that he/she busts on the next roll? *(Your friend would have to roll a sum of 8 or greater. The probability of this happening is $(5+4+3+2+1)/36 = 15/36 = 5/12$. Chances are somewhat less than 50-50.)*
 - Assuming that your friend elects to continue playing and not hold, what is the probability that he/she lands on 21 on the next roll? *(Your friend would have to roll a sum of 7, whose probability is $6/36 = 1/6$.)*
5. Here is a more challenging problem. What is the probability of getting 21 in exactly two rolls of the pair of dice? *(You would have to roll 9 followed by 12, or 12 followed by 9, or 10 followed by 11, or 11 followed by 10. When two events are independent, the probability that both events occur is the product of their separate probabilities. The probability of 9 followed by 12 is therefore $4/1296$. Similarly for 21 followed by 9. The probability of 10 followed by 11 is $6/1296$. Similarly for 11 followed by 12. Answer: $20/1296$.)*