

Practice Problems for 2022-2023 Mettl Assessment

1. You roll a 4-sided die, numbered 1-4. Your payoffs for this game are:

Roll	Payoff
1	\$1.00
2	\$2.00
3	\$3.00
4	\$10.00

What is your expected profit from this game?

2. We have three pancakes. One is burnt on two sides, one on one side, and one not at all. The pancakes are stacked on a plate in such a way that all that can be seen is a burnt side on top. How likely is it that the fully burnt pancake is the one on top?
3. A roulette wheel has the numbers 0, 00, and 1 through 36 arranged randomly across its 38 slots. The probability that the ball will fall onto an odd-numbered space (1, 3, 5, ..., 35) can be expressed as " $x / 38$ ". What is the value of x ? (Neither 0 nor 00 is odd.)
4. All rabbits are mammals. No mammal is cold-blooded. Therefore...
- Some rabbits are cold-blooded.
 - No rabbits are cold-blooded.
 - All rabbits are cold-blooded.
 - ...we cannot draw any of the above conclusions.
5. You flip a weighted coin that comes up Heads 40% of the time and Tails 60%. If you flip this coin 5 times, what is the probability that you see at least 3 Tails, rounded to the nearest percent? Please input your answer as a decimal rounded to the nearest hundredth.
6. Hank is holding a red lollipop that is 20% to be cherry, 30% to be strawberry and 50% to be cinnamon. If it is cherry or strawberry, he will eat every bite, but if the lollipop is cinnamon, it's going straight in the trash. An hour later, Hank is happily finishing the lollipop. What is the probability that it was cherry?
7. You are on an island inhabited by three types of people: those who only tell the truth (knights), those who only tell lies (knaves), and those who sometimes tell the truth and sometimes tell lies (spies). Knaves are said to be of the lowest rank, spies of middle rank, and knights of highest rank. Two people stand before you: A and B.

A says, "I am a knave and you are a spy."

B says, "That is not true. I am of lower rank than you."

What are A and B?

- A is a knight, B is a knight
- A is a knight, B is a spy

- A is a knight, B is a knave
- A is a spy, B is a knight
- A is a spy, B is a spy
- A is a spy, B is a knave
- A is a knave, B is a knight
- A is a knave, B is a spy
- A is a knave, B is a knave
- Not enough information