Year 8 Worksheet 4: Probability

Question 1: Answer the following.

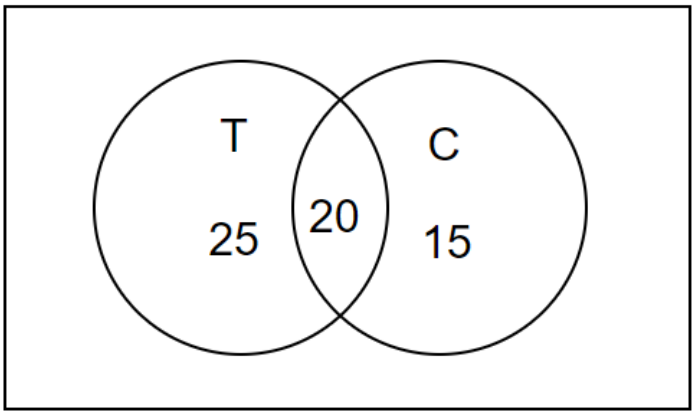
1	The probability of a certain event is: A) 1% B) 10% C) 50% D) 100%
2	What is the probability of a baby being born on a weekend rather than on a weekday? A) 2/3 B) 2/7 C) 2/5 D) 5/7
3	If a die is rolled, how many different outcomes are possible? A) 6 B) 4 C) 12 D) 2
4	What is the probability of rolling an odd number on a die? A) 0.02 B) 0.05 C) 0.2 D) 0.5
5	A weather forecaster says that in June, the chance of rain on any day is 20%. How many rainy days are expected in June? A) 6 B) 9 C) 10 D) 21

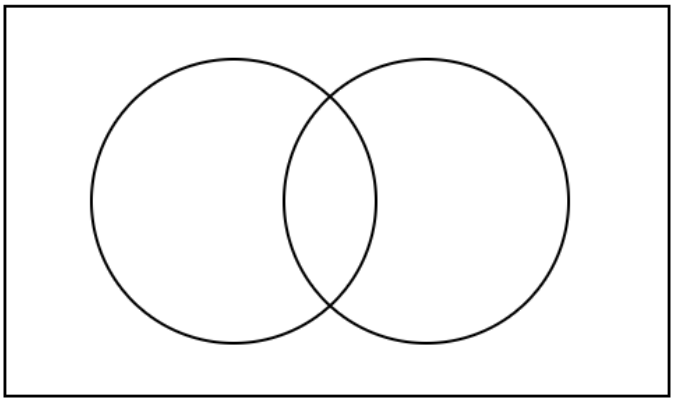
6	The set of all possible outcomes of a situation is: A) a complementary event B) the probability C) the sample space D) a Venn diagram
7	On a busy street, the probability that a traffic light shows green is 33%. What is the probability that it will not show green? A) 33% B) 77% C) 66% D) 67%
8	The lowest possible probability value is: A) 0 B) 0.01 C) 0.1 D) 1
9	If a letter is chosen at random from the alphabet, what is the probability that it is a vowel or the letter Y? A) 1/26 B) 5/26 C) 1/13 D) 3/13
10	For the result of a soccer match, what is the complementary event to a win? A) a loss B) a draw C) a loss or a draw D) neither a loss nor a draw

Question 2: Answer the following.

1	In a deck of playing cards, determine the probability of drawing: a) a red card (hearts or diamonds). b) a face card (jack, queen, or king). c) a spade or a club. d) a card with a prime number.
2	For the color of traffic lights, list all of the possible outcomes. Explain why each outcome is not equally likely.

3	In a sock drawer, there are 12 white socks, 7 black socks, 9 gray socks, and 15 striped socks. One sock is chosen at random from the drawer. a) What is the least likely color to be chosen? What is the probability? b) What is the complementary event to choosing a gray sock? What is the probability? c) Write as a percentage the probability that the sock: i) is striped ? ii) is not striped ?
4	If the universal set U contains 50 elements, set A contains 30 elements, and set B contains 25 elements, how many elements are in the intersection of sets A and B?

5	In a survey, 80 people were asked if they prefer tea (T) or coffee (C) or both.  a) How many people prefer both tea and coffee? b) How many people prefer coffee? c) How many people prefer tea? d) How many people do not prefer either tea or coffee?

6	In a class of 25 students, 20 students play soccer (S), 8 students play basketball (B), and 1 did not play any sport. a) Create a Venn diagram to represent this data.  b) How many students play both soccer and basketball? c) What is the probability of students that: i. Play soccer only? ii. Do not play basketball? iii. Play soccer or basketball? iv. Play soccer or basketball but not both?

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Answer Key

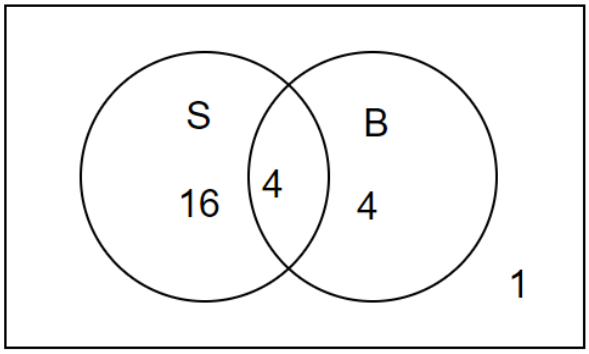
Question 1: Answer the following.

1	The probability of a certain event is: A) 1% B) 10% C) 50% D) 100% Answer: D) 100%
2	What is the probability of a baby being born on a weekend rather than on a weekday? A) 2/3 B) 2/7 C) 2/5 D) 5/7 Answer: B) 2/7
3	If a die is rolled, how many different outcomes are possible? A) 6 B) 4 C) 12 D) 2 Answer: A) 6
4	What is the probability of rolling an odd number on a die? A) 0.02 B) 0.05 C) 0.2 D) 0.5 Answer: D) 0.5
5	A weather forecaster says that in June, the chance of rain on any day is 20%. How many rainy days are expected in June? A) 6 B) 9 C) 10 D) 21 Answer: A) 6

6	The set of all possible outcomes of a situation is: A) a complementary event B) the probability C) the sample space D) a Venn diagram Answer: C) the sample space
7	On a busy street, the probability that a traffic light shows green is 33%. What is the probability that it will not show green? A) 33% B) 77% C) 66% D) 67% Answer: B) 77%
8	The lowest possible probability value is: A) 0 B) 0.01 C) 0.1 D) 1 Answer: A) 0
9	If a letter is chosen at random from the alphabet, what is the probability that it is a vowel or the letter Y? A) 1/26 B) 5/26 C) 1/13 D) 3/13 Answer: D) 3/13
10	For the result of a soccer match, what is the complementary event to a win? A) a loss B) a draw C) a loss or a draw D) neither a loss nor a draw Answer: D) neither a loss nor a draw

Question 2: Answer the following.

1	a) Answer: The probability of drawing a red card is 26/52, which simplifies to 1/2. b) Answer: Probability = 12 / 52 = 3/13 c) Answer: Probability = 26 / 52 = 1/2 d) Answer: Probability = 4 / 52 = 1/13
2	Answer: The possible outcomes for the color of traffic lights are: Red, Yellow, and Green. Each outcome is **not equally** likely because traffic light durations are designed to control traffic flow. In most cases, green lights are kept on longer than red or yellow lights to allow for the smooth flow of traffic. Therefore, green is more likely to occur than red or yellow.
3	a) Answer: The least likely color to be chosen is **black**, as it has the fewest socks (7) compared to the other colors. Probability of choosing a black sock: 7/43 b) Answer: This includes white, black, and striped socks. Probability of choosing a gray sock: 9/43 Probability of NOT choosing a gray sock: 34/43 c) i) Answer: Probability of choosing a striped sock: 15/43 = 34.88% ii) Answer: The probability of not selecting a striped sock: 28/43 = 65.12%
4	The number of elements in the intersection of sets A and B can be found by subtracting the elements outside the intersection.

	So, the number of elements in the intersection is 30 (elements in A) + 25 (elements in B) - 50 (total elements in U) = 5 elements.
5	a) 20 people prefer both b) 35 people prefer coffee c) 45 people prefer tea d) 20 people do not prefer both tea and coffee
6	a) Create a Venn diagram to represent this data.  b) 4 c) What is the probability of students that: i. 16/25 ii. 17/25 iii. 24/25 iv. 20/25 or 4/5