

2023 MTAP Saturday Program in Mathematics Grade 8 Session 6

Part I.

A. Determine the **sample space and cardinality** in each experiment. For items 1-5, represent the sample space using Ω . Use the proper notation of presenting the cardinality of each set.

1. rolling a die followed by tossing a fair coin
2. tossing three coins simultaneously
3. selecting 3 letters (order of choosing not important) at random from *M, A, T, H*
4. picking 3 balls one at a time without replacement from a box containing 3 similar balls, 1 blue, 1 orange, 1 yellow
5. picking a raffle ticket from a jar containing tickets numbered from 01-30.
6. Consider the event of selecting a card at random from a standard card deck. List down the sample space of the following events.

$$\begin{array}{ll} A = & \text{Event of drawing a face card} = \{ \quad \quad \quad \} \\ B = & \text{Event of drawing an ace} = \{ \quad \quad \quad \} \\ C = & \text{Event of drawing a spade} = \{ \quad \quad \quad \} \end{array}$$

B. Find the indicated **event** in each experiment.

1. A card is chosen at random from a deck of 52 cards. Find the event that the card is
 - a jack.
 - an even number
 - a diamond.
 - in a red suit.
2. The digits 0, 1, 2, 3, 4, 5, 6 are written on slips of paper for a simple raffle activity. The slips were placed in a box and thoroughly mixed. One slip of paper is chosen at random. Find the event that the number drawn is
 - a multiple of 3.
 - an odd number.
 - greater than 2.
3. Two fair dice are rolled. Find the event that the two numbers show
 - a sum of 7.
 - a sum exactly equal to 6.
 - both even numbers.
 - both odd numbers.

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{jack of ♦, jack of ♣, jack of ♠, jack of ♠}

{2♦, 4♦, 6♦, 8♦, 10♦, 2♣, 4♣, 6♣, 8♣, 10♣, 2♠, 4♠, 6♠, 8♠, 10♠}

{ace of ♦, 2♦, 3♦, 4♦, 5♦, 6♦, 7♦, 8♦, 9♦, 10♦, jack of ♦, queen of ♦, king of ♦}

{suit of ♦, suit of ♣}

{0,3,6}

{1,3,5}

{3,4,5,6}

{(1,6), (2,5), (3,4), (4,3), (5,2), (6,1)}

{(1,5), (5,1), (2,4), (4,2), (3,3)}

{(2,2), (4,4), (6,6), (2,4), (2,6), (4,2), (4,6), (6,2), (6,4)}

{(1,1), (3,3), (5,5), (1,3), (1,5), (3,1), (3,5), (5,1), (5,3)}

C. Tree Diagram and Situation Analysis

Situation:

Suppose in a school canteen, fish and vegetables are the food options for a student's lunch meal; while fruit juice, iced tea, and bottled water are the choices for the drinks and beverages. Below is the menu of the school canteen with each item's respective price.

• Fish	.....	PHP 70.00
• Vegetables	.....	PHP 50.00
• Fruit Juice	.....	PHP 35.00
• Iced Tea	.....	PHP 20.00
• Bottled Water	.....	PHP 15.00

1. Illustrate a tree diagram that can represent a lunch combo based on the available options in the menu.



2. Considering the prices of the given meal options, which lunch combo will be the

- least expensive:
- most expensive:

3. If Mary allots PHP 400.00 as her 5-school days lunch allowance, which lunch combo could she possibly avail, considering that her chosen combo meal should not be the same for consecutive days? List at least 3 possible combinations for the student's 5-day meal.

	5-day Meal #1	5-day Meal #2	5-day Meal #3
Day 1			
Day 2			
Day 3			
Day 4			
Day 5			
Total	PHP 395.00	PHP 395.00	PHP 395.00

Part II. Read and analyze each situation, then find its probability value.

- A card is picked from a standard deck of cards. Determine the probability that this will not be a number card. Express your answer in fraction form.
- Suppose you want to play with two dice, and you want these two to be both odd numbers when rolled at the same time, what is the probability (in percent form) of getting this result?
- Joy wanted to pick a card randomly from a regular deck of 52 cards. What is the probability that Joy draws a black ace card?
- MJ owns 16 polo shirts, 6 of which are green. If MJ randomly selects a polo shirt to wear, what is the probability that it will be green? Express in decimal form.
- A bag contains 12 balls numbered 1 to 12
 - What is the probability of selecting a 2 from the bag?
 - What is the probability of selecting an even number?
 - What is the probability of selecting a number less than 10?
- A student rolls a die. What is the probability that a number divisible by both 2 and 3 will appear?