SPECIAL THIS SUMMER

# **MUSIC ESIVA**

## 29TH NOVEMBER, 2024

### KENSINGTON COMMUNITY HIGH SCHOOL

Let's dance together to songs from famous bands in our community. Exclusive tickets only at

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Music festival project 2024			
Name:		Class:	
= fluency	= problem solving	= reasoning	

#### Part 1 – ORGANISING THE FESTIVAL

Kensington Community High School are currently preparing for this year's Festival. They look at data from last year's festival to see what items we should sell again this year.

A survey was sent out to festival goers and 96 of them responded. They were asked what items they purchased at the festival.

• QUESTION 1: Complete the table below displaying the fraction, decimal and percent of people who purchased each item.

ITEM	FRACTION	DECIMAL	PERCENT
Pizza	$\frac{33}{96} = \frac{11}{32}$		
Burger		0.53	
Dumplings		0.03	
Fairy Floss			8%
Waffles			29%
Coke	$\frac{20}{96}$		
Water	51 96		

QUESTION 2: What was the best-selling item at last year's festival?

QUESTION 3: Based on sales from last year's festival, suggest which items should and shouldn't be ordered this year? Explain your answers.

▲ QUESTION 4: For this year's festival, organisers decide to order water and coke in a ratio of 5 to 1. If 240 bottles of coke have been ordered, how many bottles of water have been ordered? Show your working out.

Question 5: You are assigned with purchasing beverages for the festival, and you want to make the most cost-effective choice between different packs. Below are the details for three different packs of bottled water and three different packs of Coke (Bottles and Cans):

	Unit price (\$ per L)		Unit price (\$ per L)
Woolworths Spring Water		Coca - Cola Classic Soft Drink	
Bottles 600ml X24 Pack <u>\$9.5</u>		Mini Bottles 300ml X 12 Pack	
		\$11.4 Special CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
Woolworths Spring Water		Coca - Cola Classic Soft Drink	
12x600ml <u>\$5</u>		Multipack Cans 375ml X 30	
		Pack <u>\$44.9</u>	
Color and Color		CLASSIC 30 DEC	
Nu Pure Still Spring Water		Coca - Cola Classic Soft Drink	
20x600ml <u>\$10.5</u>		Mini Cans 250ml X 6 Pack <u>\$5.5</u>	
EDERAL COLOR Spring Water		Speciel Marcaminia CLASSIC GIND	

- a. Calculate the unit price (cost per litre) for each option.
- b. Compare the unit prices of water to determine which pack offers the best value.
- c. Compare the unit prices of water to determine which pack offers the best value.
- d. Discuss any considerations or factors besides price that might influence your decision.

e. If you were to choose one beverage for the event, which one would you choose and why?

Question 6: We also have to order merchandise to sell at next year's festival. We can look at information on what merchandise sold last year. Last year **1000 pieces** of each of the following items were ordered. The table below shows the proportion of each item that was sold.

ITEM	NUMBER OF AVAILABLE ITEMS SOLD
Hoodie	5 7
Beanie	1.0
	29
Сар	30
Water Bottle	0.46
Poster	22%

a. Based on the information above, order items from the most sold item to the least sold item.

MOST SOLD ITEM	1.
	2.
	3.
	4.
LEAST SOLD ITEM	5.

b. Based on the number of each item that was sold last year, suggest how many of each item sold be ordered for next year's festival. The same amount of tickets will be available as last year. Explain your thinking.

ltem	Number to be purchased	Explanation
Hoodie		
Beanie		
Сар		
Water Bottle		
Poster		

Question 7: Based on your table above, you've decided number to be purchased. Below are the costs and selling prices for each item in Australian dollars:

Item	Purchase Cost	Selling Price
Hoodie	\$50	\$78
Beanie	\$10	\$26
Сар	\$14	\$25
Water Bottle	\$5	\$12
Poster	\$2	\$5

- a. Calculate the profit for each item.
- b. Determine which item has the highest profit margin (percentage profit relative to the cost).
- c. Discuss any observations or insights regarding the profitability of the items.

• Question 8: The organizers of the music festival are planning to upgrade the surface of the main stage to enhance its visual appeal.

The current stage is in the shape of a rectangular prism, with dimensions 30 meters in length, 20 meters in width, and 5 meters in height. The upgrade involves applying a special coating to the entire surface of the stage.



- a. Calculate the total surface area of the current stage.
- b. Due to budget constraints, the organizers decide to upgrade only the top and sides of the stage, leaving the bottom as it is. Calculate the area of the top of the stage.
- c. The special coating costs \$10 per square meter. Determine the total cost of applying the coating to the top of the stage.
- d. Discuss the implications of choosing to coat only the top of the stage in terms of cost savings and the visual impact on the audience.

#### Part 2 – ATTENDING THE FESTIVAL

Question 9: On the day of the music festival, an overwhelming number of students gathered to enjoy the performances at the main stage. It's necessary to enhance crowd control and ensure the safety of both the audience and the performers.

A temporary circular barrier with a radius of 20 meters needs to be set up around the main stage. We need to find the total perimeter of the circular barrier. This measurement was crucial to assess the amount of fencing required to encircle the stage area and guide the excited crowd.



Question 10: In response to the overwhelming attendance at the music festival, as the organizer, you've put a twin Cola reservoir next to the barrier.



The reservoir contains two cylindrical jars, each contains refreshing cola. These two jars, boast the following dimensions: a radius of 9 cm and a height of 33 cm.

a.calculate the total volume of cola that the twin jars can accommodate.

b. How many 375ml coke cans will it take to gracefully fill both captivating jars?

• QUESTION 11: You are lucky enough to be one of the first 100 people to buy a ticket. How much will you save after the 25% discount is applied?

QUESTION 12: Unfortunately, you and your friend miss out on the first 100 tickets. You decide to put your money together to get the discount of buying more than 1 ticket at a time. How much will you each pay for your ticket?

## QUESTION 13: The table below shows the length (in hours) of each act's performance throughout the festival.

Main Stage Act	Eminem	Guns n Roses	Coldplay	The Kid Laroi	Ed Sheeran
Number of Hours Performing	20	31	6	9	2

Given that you wander over to the main stage once at random during the Music Festival, calculate the probability of each act playing as you arrive. **All answers should be presented as a percentage.** Simplify all answers where possible.

Eminem	Guns n Roses	Coldplay	The Kid Laroi	Ed Sheeran

QUESTION 14: Use the probability scale below to predict the likelihood of the following event occurring while you are at the music festival. Record your results in the table below.



**QUESTION 15:** You are planning to go to all 6 days of the festival.

You decide to **pay extra for a VIP access-all-areas ticket for one of these days**. The days are allocated randomly.

You presume there is an equal probability of being given any of the days and decide to make a probability table showing different possible outcomes. Complete the table below.

Saturday	
Any Weekday	
Weekend	

**QUESTION 16:** 

This table below shows how a randomly selected 60 of the VIP tickets were allocated.

DATE	FREQUENCY
Thursday 5 <sup>th</sup> January	9
Friday 6 <sup>th</sup> January	11
Saturday 7 <sup>th</sup> January	20
Sunday 8 <sup>th</sup> January	2
Monday 9 <sup>th</sup> January	8
Tuesday 10 <sup>th</sup> January	10

What observations do you make about the VIP tickets available for each day of the festival?

#### Part 3 – AFTER THE FESTIVAL

#### Question 17:

At the end of the festival, group festival goers were surveyed about their experience at the festival.

- This Stem and Leaf Plot below shows the ages of the festival goers who were surveyed.
- STEM LEAF key: 5|4=54 1 2334446779 2 00134445888899 3 11356668999 4556888 4 5 45779 6 114 7 03889 8 8
- a. What age was the oldest person who was surveyed? What age was the youngest person who was surveyed? Please find the range of age.
- b. Based on the stem-and-leaf plot, determine the average age, mode age, and median age for the festivalgoers.

Average age	
Median age	
Mode age	

- c. Mark calculated that the average age of the festival goers is 38. Therefore, is it correct to say that the largest group consists of people in their 30s? Please explain why.
- **d.** It appears that there is an individual with an age of 88 who attended the music festival. Could this age be considered an outlier within our dataset?
- e. Draw a box plot for our dataset.

QUESTION 18: State 2 other things that you notice from this data.

1 –



The group of festival goers surveyed, were asked if they watched Ed Sheeran perform.

Some of the festival goers were VIP Ticket holders and some of them were Standard Ticket holders.

	VIP Ticket Holder	Standard Ticket Holder	Total
Watched Ed Sheeran	7	16	23
Did not watch Ed	13	19	32
Sheeran			
Total	20	35	

- a. What percent of VIP Ticket holders watched Ed Sheeran perform?
- b. If a person was selected at random, what is the probability they were a VIP Ticket holder?

- c. What fraction of festival goers did not watch Ed Sheeran?
- d. Of the people surveyed, what proportion were Standard Ticket holders? Display your answer as a decimal, rounded to 3 decimal places.