

Mathematics

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(Chapter - 10) (How Quantities Combine: Understanding Data) (Assignment 5)

(Class - 9)

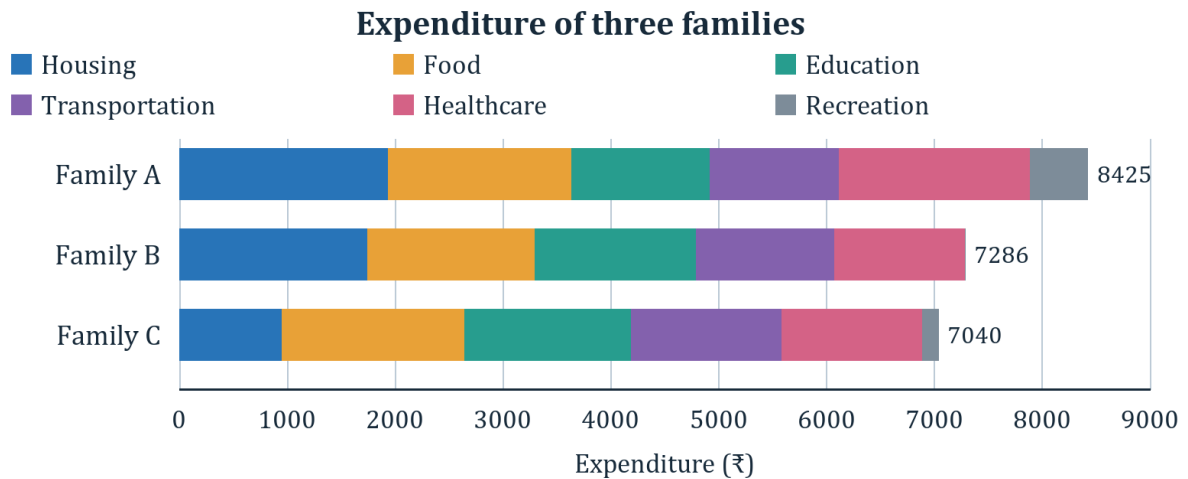
Name _____

Date _____

Answer all 15 questions. Choose one option for each MCQ. Show your working and give reasons where required.

Section A: Multiple Choice Questions

1. Which family spent the least amount overall?



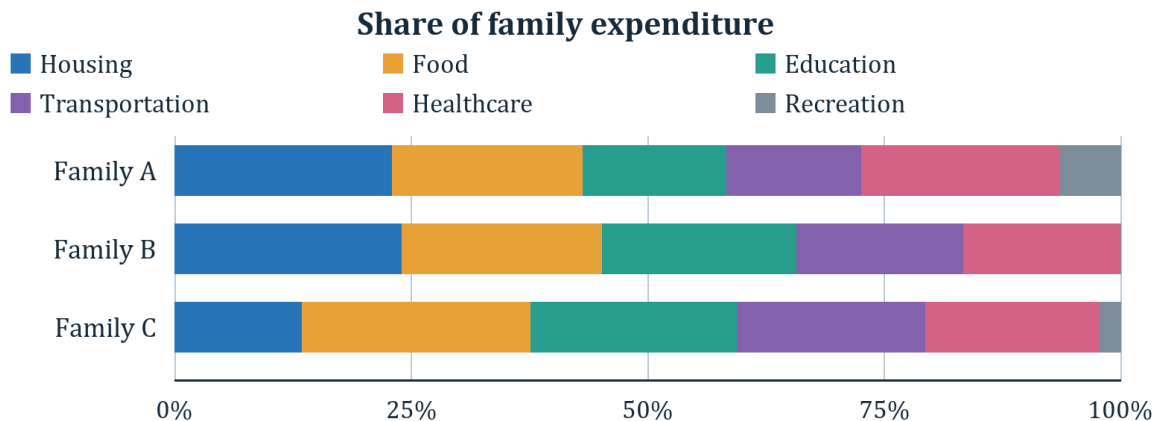
(a) Family A

(b) Family B

(c) Family C

(d) All three equally

2. Which family has the smallest share of their total expenditure towards healthcare?



(a) Family A

(b) Family B

(c) Family C

(d) All three equally

3. A bowl of 500 mL lemonade has 10% jaggery. A glass of 200 mL lemonade has 20% jaggery. If we mix the lemonade from the bowl and the glass, what is the concentration of jaggery in the mixture?

(a) 10%

(b) Approximately 12.86%

(c) 15%

(d) 20%

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4. Given a stacked bar chart can we make a corresponding 100% stacked bar chart?
- (a) Yes, using each bar's total. (b) Only if the totals are equal.
(c) No, never. (d) Only when there are two parts.
5. A category's count falls from 40 to 30 while the overall total falls from 100 to 50. What happens to the category's share?
- (a) It falls from 40% to 30%. (b) It rises from 40% to 60%.
(c) It stays at 40%. (d) It rises from 30% to 50%.

Section B: Very Short Answer Questions

6. The average score of students on a test in Section A is 72 and that of students in Section B is 76. What is the combined average of both the sections given that Section A has 30 students and Section B has 25 students?

Answer:

7. What kind of inferences or comparisons can be made from a stacked bar chart and in a 100% stacked bar chart?

Answer:

8. Why did Method 1 not work?

In the badminton example, Method 1 used $(165.5 + 149.33)/2$ for eight seniors and three juniors.

Answer:

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9. A 600 mL solution with 5% salt is mixed with a 300 mL solution with 8% sugar. What are the concentrations of salt and sugar in the mixture?

Answer:

10. (Śrīdharācārya, Pāṭīgaṇita, c. 750 CE) In ancient India, Varṇa was the measure of gold purity. A purity of 16 varṇa meant pure gold; in general, a purity of k varṇa meant that the gold-alloy was $k/16$ gold and the rest impurities. (Now the term used is karat; 16 Varna = 24 karat.)

Suppose a goldsmith melts together three pieces of gold: 9 units at 12 varṇa, 5 units at 10 varṇa, and 17 units at 11 varṇa. Find the purity in varṇa of the combined gold.

Answer:

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11. The following table shows the average weekly expenditure, in rupees (₹), of three families across categories. What would a cluster-column chart for this data look like?

Category	Family A	Family B	Family C
Housing	1940	1750	950
Food	1700	1546	1700
Education	1280	1500	1540
Transportation	1200	1280	1400
Healthcare	1770	1210	1300
Recreation	535	0	150

Answer:

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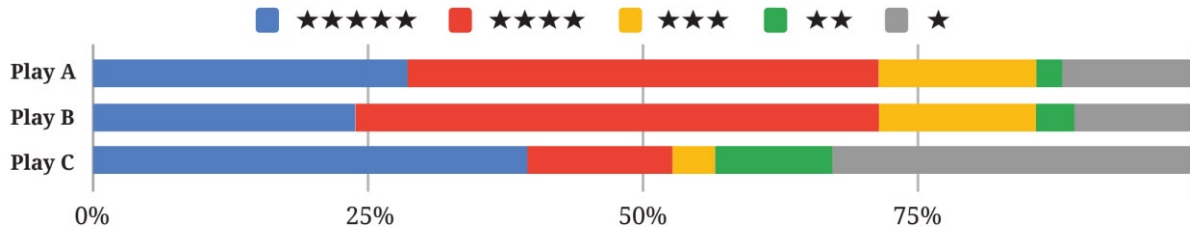
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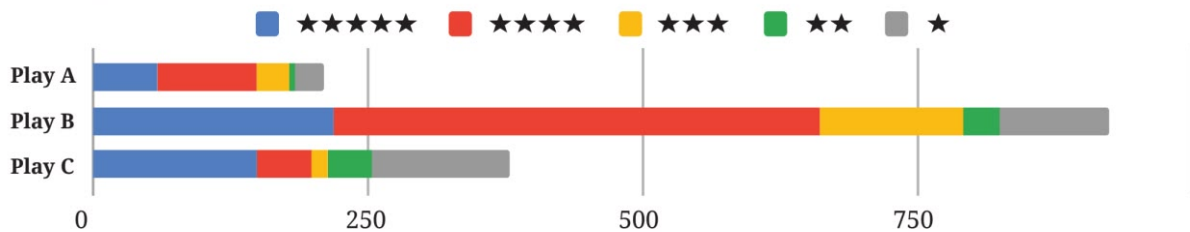
12. Decision Dilemma:

- (i) Which of the plays would you choose to watch based on the following chart?
- (ii) The corresponding stacked bar chart is shown below. Would you change your decision after looking at this chart? Why/Why not? Discuss.

Share of ratings of three plays



Ratings of three plays



Answer:

13. Class A has 20 students: 12 choose sport and 8 choose art. Class B has 40 students: 20 choose sport and 20 choose art. Draw a 100% stacked bar chart. Which class has the larger sport share, and which has more students choosing sport?

Answer:

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- (i) What is a suitable representation of this data — a stacked bar chart or a 100% stacked bar chart? Why do you think so?

Time (hh:mm)	Swimming	Cycling	Running
Athlete 1	01:08	05:00	03:15
Athlete 2	01:05	05:10	03:35
Athlete 3	01:22	05:55	03:50

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- $$\begin{aligned} \text{(i)} & \quad \frac{35 \times 3 + 44 \times 4 + 80 \times 5}{3 + 4 + 5} \\ \text{(ii)} & \quad \frac{(35/100) \times 3 + (44/100) \times 4 + (80/100) \times 5}{3 + 4 + 5} \\ \text{(iii)} & \quad \frac{(35/50) \times 3 + (44/60) \times 4 + (80/100) \times 5}{3 + 4 + 5} \times 100 \\ \text{(iv)} & \quad \frac{(35/50 \times 100) \times 3 + (44/60 \times 100) \times 4 + (80/100 \times 100) \times 5}{3 + 4 + 5} \end{aligned}$$

Answer: