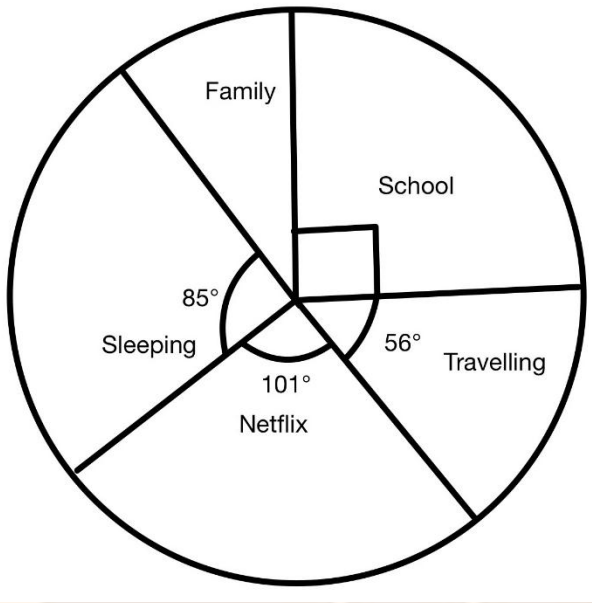


8 ESSENTIAL QUESTIONS TO MASTER

PERCENTAGE

1	(a) Emma's weekly salary was \$750. Her salary was increased by 15%. Calculate her new salary. [1] (b) Michael spends 35% of his savings on a laptop that costs \$2100. What is the total amount of savings he had before he spent on the laptop? Give your answer to 2 decimal places. [1]	
2	Ms Chen made a 7:00 PM restaurant reservation at Downtown Plaza for her birthday dinner. She plans to arrive 20 minutes before the reservation timing and leave at 9:30 PM. Parking rates for two different parking facilities in the area are shown below. **City Center Parking:** 6 AM - 11:59 PM - 1st hour \$4.50 Every subsequent hour or part thereof \$3.75 **Plaza Underground Parking:** 24 hours Flat rate from 6PM - 12AM \$8.00 Hourly rate (before 6PM) \$5.00 (a) Explain, with working, which parking facility should Ms Chen park at. [2] (b) At the restaurant, Ms. Chen and friends ate a total of \$240 worth of food. When the bill arrived, it was \$292.80. Ms. Chen claimed that with 22% Service Charge and GST, the bill that arrived was wrong. Her working is shown below. [3] Ms. Chen's working: Total = $\\$240 \times (122 \div 100) = \\$292.80$ Evaluate Ms Chen's working and explain, with working to support your answer, if Ms Chen's claim is accurate and why.	
3	Jennifer and David went for dinner at Coastal Breeze Restaurant. Their dinner consisted of the items shown on the receipt below: Coastal Breeze Restaurant Date: 15/04/2023 Time: 19:30 Table: 24 Server: Emma ----- 2 Grilled Salmon \$42.00 2 Caesar Salad \$14.00 2 Premium Beverages \$16.00 SUBTOTAL \$72.00	

	15% First-time discount (a) 12% Service charge (b) 8% GST (c) TOTAL BILL (d) Jennifer and David were first-time customers and received a 15% discount on all items. Find the amount of: (a) First-time discount (b) Service charge (c) GST (d) Total bill	[1] [2] [1] [1]
4	The pie chart below shows the activities of Alex in a day. There are 24 hours in a day.  (a) Express the amount of time he spent on Netflix as a percentage of all the time he has in a day. (b) Find the ratio of time spent on family to school. (c) Bob sleeps twice as long as Alex in a day. How many hours does Bob sleep in a day? (d) Explain why it is better to represent the time Alex spent on activities in a day as a pie chart and not a bar graph.	[2] [2] [2] [1]
5	Maria bought a laptop for \$720 after receiving a discount of 20% from an electronics store. What was the original price of the laptop?	[1]
6	(a) Class A had 15 out of 40 students scoring distinction for a Science test. Class B had 18 out of 45 students scoring distinction for the same test. Which class had a higher percentage of students scoring distinction? Show your working clearly. (b) The original price of a laptop was \$1500. It was sold for a price of \$1275. Find the percentage decrease in price.	[2] [1]
7	Every year, the value of a boat depreciates by 12% of its value in the previous year. If the value of the boat was \$72,600 in 2022, find its value in 2020.	[2]
8	David deposits \$5000 in Bank X at a simple interest rate of 1.5% per annum for 24 months.	

	Sarah deposits the same amount in Bank Y at a simple interest rate of 4% per annum. After 24 months, Sarah's total interest amount is \$40 more than David's total interest. (a) Find the value of r . (b) Find the total amount that Sarah will have in Bank Y after 6 years.	[3] [2]
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Answer Key:

1	(a) Emma's weekly salary calculation: Original salary = \$750 Salary increase = \$15% of original salary Salary increase amount = $\\$750 \times 0.15 = \\$112.50$ New salary = Original salary + Increase amount = $\\$750 + \\$112.50 = \\$862.50$ Therefore, Emma's new weekly salary is \$862.50. (b) Michael's savings calculation: Let's denote Michael's total savings before buying the laptop as x. Given: - Michael spent 35% of his savings on a laptop - The laptop costs \$2100 We can write the equation: $\begin{aligned} 35\% \times x &= \$2100 \\ 0.35 \times x &= \$2100 \\ x &= \$2100 \div 0.35 \\ x &= \$6000 \end{aligned}$ Therefore, Michael had \$6000 in savings before buying the laptop.	
2	(a) Comparing parking costs at City Center Parking vs Plaza Underground Parking First, let's determine Ms. Chen's parking duration: - Arrival: 7:00 PM - 20 minutes = 6:40 PM - Departure: 9:30 PM - Total parking time: 2 hours and 50 minutes Now, let's calculate the parking cost at each facility: City Centre Parking: - First hour: \$4.50 - Remaining 1 hour 50 minutes = 2 hours when rounded up (since they charge by the hour or part thereof) - 2 hours $\times$ \$3.75 = \$7.50 - Total cost: $\\$4.50 + \\$7.50 = \\$12.00$ Plaza Underground Parking: - Ms. Chen arrives at 6:40 PM, which is after 6 PM	

	- Flat rate from 6 PM - 12 AM: \$8.00 - Total cost: \$8.00 Since Plaza Underground Parking has a lower total cost (\$8.00 vs \$12.00), Ms. Chen should park at Plaza Underground Parking. (b) Evaluating Ms Chen's bill calculation Ms Chen calculated: Total = $\\$240 \times (122 \div 100) = \\$292.80$ Let's verify if this is correct: If the restaurant charges 22% Service Charge and GST combined: - Food cost: \$240 - With 22% added: $\\$240 \times 1.22 = \\$292.80$ The bill amount charged was \$292.80, which matches Ms Chen's calculation. Therefore, Ms Chen's claim is not accurate. The bill amount of \$292.80 is correct based on a 22% combined Service Charge and GST on a \$240 food total. The restaurant charged the correct amount.	
3	- Subtotal (before discount): \$75.60 - Membership discount: 10% of all items - Service charge: 10% (applied after discount) - GST: 7% (applied after discount and service charge) (a) Membership discount Membership discount = 10% of subtotal Membership discount = $10\% \times \\$75.60 = \\$7.56$ (b) GST calculation First, find the amount after discount: Amount after discount = $\\$75.60 - \\$7.56 = \\$68.04$ (b) Service charge is applied: Service charge = $10\% \times \\$68.04 = \\$6.80$ (as shown on the bill) Amount after discount and service charge = $\\$68.04 + \\$6.80 = \\$74.84$ (c) GST = 7% of this amount: GST = $7\% \times \\$74.84 = \\$5.24$ (d) Total bill calculation Total bill = Amount after discount + Service charge + GST Total bill = $\\$68.04 + \\$6.80 + \\$5.24 = \\$80.08$ Therefore:	

	(a) Membership discount = \$7.56 (b) Service Charge = \$6.80 (c) GST = \$5.24 (d) Total bill = \$80.08	
4	(a) $\frac{101}{360} \times 100 = 28.1\%$ (b) $360^\circ - 85^\circ - 101^\circ - 56^\circ - 90^\circ = 28^\circ = 28:90 = 14:45$ (c) $\frac{85}{360} \times 24 = 5.67$ (Estimate is 6hrs) $6 \times 2 = 12$ hours (d) It easier to compare how much time he spends on each activity relative to the total amount of time he has in a day.	
5	Maria paid \$720 after a 20% discount We need to find the original price of the laptop Step 1: Let's define the original price as x . Step 2: After a 20% discount, Maria pays 80% of the original price. $\$720 = 0.80 \times x$ Step 3: Solve for x . $x = \frac{720}{0.80} = \frac{720}{0.80} = 900$ Therefore, the original price of the laptop was \$900. To verify: - 20% of \$900 is $\$900 \times 0.20 = \$180$ - $\$900 - \$180 = \$720$, which is the amount Maria paid. The original price of the laptop was \$900.	
6	(a) Comparing Class A and Class B Percentages For Class A: - Number of students scoring distinction = 15 - Total number of students = 40 - Percentage = $(15 \div 40) \times 100\% = 37.5\%$ For Class B: - Number of students scoring distinction = 18 - Total number of students = 45 - Percentage = $(18 \div 45) \times 100\% = 40\%$ Comparing the percentages: Class A: 37.5% Class B: 40%	

	Since $40\% > 37.5\%$, Class B had a higher percentage of students scoring distinction. (b) Percentage Decrease in Laptop Price Original price = \$1500 Selling price = \$1275 Decrease in price = $\\$1500 - \\$1275 = \\$225$ Percentage decrease = $(\text{Decrease in price} \div \text{Original price}) \times 100\%$ Percentage decrease = $(\\$225 \div \\$1500) \times 100\% = 15\%$ Therefore, the percentage decrease in the laptop price is 15%.	
7	Finding the Boat's Value in 2020 Given: - The boat depreciates by 12% each year - The value of the boat was \$72,600 in 2022 - We need to find its value in 2020 (2 years earlier) When a boat depreciates by 12% each year, its value in the next year is 88% ($100\% - 12\% = 88\%$) of its current value. To find the value in a previous year, we need to work backward: - If the current value is 88% of the previous year's value - Then the previous year's value = $\text{current value} \div 0.88$ Step 1: Find the value in 2021. Value in 2021 = $\\$72,600 \div 0.88 = \\$82,500$ Step 2: Find the value in 2020. Value in 2020 = $\\$82,500 \div 0.88 = \\$93,750$ Therefore, the value of the boat in 2020 was \$93,750. To verify: - 2020 value: \$93,750 - 2021 value after 12% depreciation: $\\$93,750 \times 0.88 = \\$82,500$ - 2022 value after 12% depreciation: $\\$82,500 \times 0.88 = \\$72,600$ ✓ The value of the boat in 2020 was \$93,750	

8	David deposits \$5000 in Bank X at a simple interest rate of 1.5% per annum for 24 months. Sarah deposits the same amount in Bank Y at a simple interest rate of 4% per annum. After 24 months, Sarah's total interest amount is \$40 more than David's total interest. (a) Find the value of r. 1. Calculate David's interest: - Principal $\\$ = \\$5000$ - Rate $\textcircled{R} = 1.5\% = 0.0015$ - Time (T) = 24 months = 2 years - Simple Interest = $P * R * T = \\$5000 * 0.0015 * 2 = \\$150$ 2. Calculate Sarah's interest: - Sarah's interest is \$40 more than David's, so Sarah's interest = $\\$150 + \\$40 = \\$190$ 3. Use the simple interest formula to find Sarah's interest rate: - Simple Interest = $P * R * T$ $\\$190 = \\$5000 * R * 2$ $\\$190 = \\$10000 * R$ $R = \\$190 / \\$10000 = 0.0019$ 4. Convert Sarah's interest rate to percentage: $r = 0.0019 * 100\% = 1.9\%$ Answer (a) : $r = 1.9$ (b) Find the total amount that Sarah will have in Bank Y after 6 years. 1. Calculate Sarah's interest after 6 years: - Principal $\\$ = \\$5000$ - Rate $\textcircled{R} = 1.9\% = 0.0019$ - Time (T) = 6 years - Simple Interest = $P * R * T = \\$5000 * 0.0019 * 6 = \\$570$ 2. Calculate the total amount: - Total Amount = Principal + Interest = $\\$5000 + \\$570 = \\$5570$ Answer (b) \$5570
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