# Topic 4.1 Practice Problems

1. Consider the following equations:

$$\text{A: } \frac{12}{x} = \frac{3}{4} \qquad \text{B: } 12x = 24 \qquad \text{C: } 13 - 12x = 1 \qquad \text{D: } 1.5x = 6$$

For the given values

$$x = 1,\ 2,\ 4,\ 8,\ 12,\ 16,$$

determine which values, if any, are solutions to each equation.

2. There are three gyms in a town with the following pricing structures:

| **Gym** | **Upfront Fee ($)** | **Monthly Fee ($)** |
|---|---|---|
| A | 50 | 10 |
| B | 0 | 25 |
| C | 30 | 15 |

   (a) What is the total cost of each gym after 10 months?

   (b) Suppose the budget for Gym A is $120. Paul says this covers 5 months, Sally says 6 months, and Omer says 7 months. Who is correct? Justify your answer.

   (c) Omer and Ali start in the same month. Omer goes to Gym B and spends $400 total. How much does Ali spend if he goes to Gym C?

   (d) A new Gym D has an upfront fee of $5. Determine the monthly fee so that after 10 months, the total cost equals that of Gym C.

3. Write four equations using the variable $x$ such that the solution is $x = 9$. Each equation must use a different operation: addition ($+$), subtraction ($-$), multiplication ($\times$), and division ($\div$). Verify that $x = 9$ satisfies each equation.

4. There are four amusement park rides. Let $n$ represent the number of normal riders and $c$ represent the number of children. Ride costs are given below:

| **Ride** | **Cost** |
|---|---|
| The Cyclone | $4n + 2c$ |
| Thunder Run | $7n + 3c$ |
| Sky Screamer | $6n$ |
| Wild Rush | $8n + 4c$ |

   If a variable is missing, that group is not allowed on the ride. If there are 4 normal riders and 4 children and the total budget is exactly $24, determine which ride(s), if any, they can take.

5. You have $50.00 to spend at a bookstore. You purchase:

SAT book: $29.99 Comic book: $13.67

You would also like to buy:

6 book covers at $2.99 each, a stapler for $6.34, and a bookmark for $4.50.

Determine the most expensive additional item you can afford without exceeding your budget.