

RAM MATHS CIRCLE – NASHIK

BHAS BHAMRE ACADEMY

Session – 3

Date – 22 August 2026
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Introduction:

Welcome to Session–3 of RAM Maths Circle. This problem sheet contains a collection of logical, combinatorial and problem-solving questions designed to develop mathematical thinking, creativity and reasoning skills. Students are encouraged to explore different approaches and justify their solutions carefully.

1. The cost of a samosa and the cost of a vadapav are both integral numbers of rupees.

In a class, each boy buys a samosa and each girl buys a vadapav. Their total expenditure is one rupee more than if each boy buys a vadapav and each girl buys a samosa. There are more boys than girls.

- How many more?
- Which is more expensive: samosa or vadapav?
- What if the difference of expenditure is
 - (a) 5 rupees?
 - (b) 15 rupees?

2. Pack fifteen 2×3 chocolate pieces into a 7×13 box, leaving a 1×1 hole.

How many 3×4 chocolate pieces can we pack into an 11×11 box?

3. A grasshopper jumps 1 cm. Then it jumps 2 cm in the same or the opposite direction. Then it jumps 3 cm in the same or opposite direction, and so on.

Can the grasshopper get back to the starting point on the 9th jump?

A grasshopper jumps 1 cm. Then it jumps 3 cm in the same or opposite direction. Then it jumps 5 cm in the same or opposite direction, and so on.

Can the grasshopper get back to the starting point on:

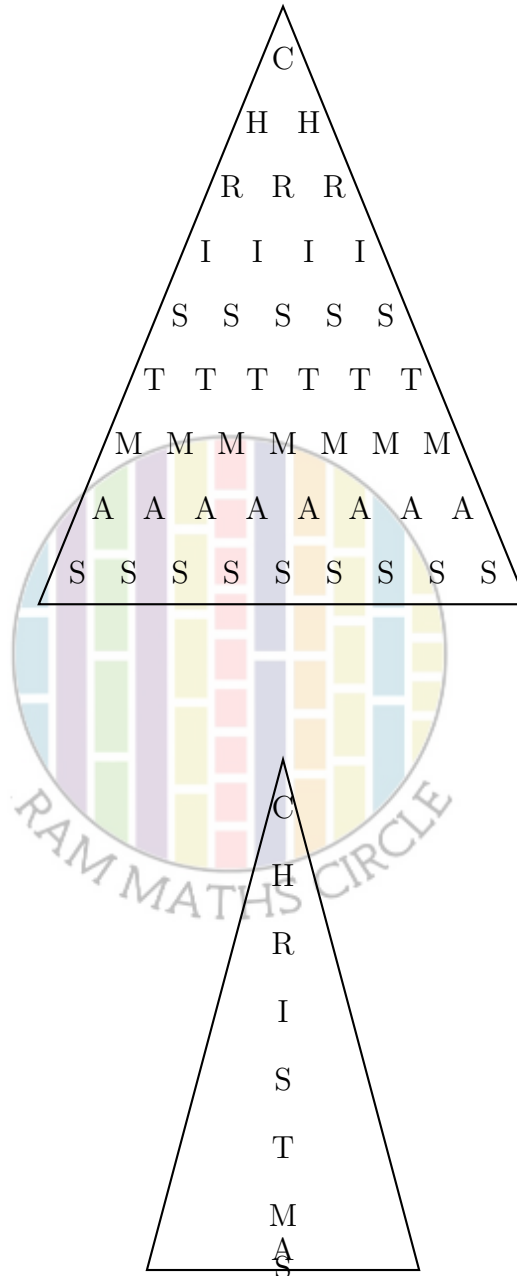
- (a) 4th jump?
- (b) 25th jump?
- (c) 6th jump?

A grasshopper jumps 2 cm. Then it jumps 4 cm in the same or opposite direction. Then it jumps 6 cm in the same or opposite direction, and so on.

Can the grasshopper get back to the starting point on the 5th jump?

4. The aim of this puzzle is to maximise the number of presents John will get.

John's mother tells him that the number of presents he gets will be the number of ways you can spell the word **CHRISTMAS** using the triangle below, by starting at C and moving down one row at a time diagonally to the left or right.



For example:

- What's the maximum number of presents John can get?
- Replace each letter by the number of routes from the top to that letter. Do you notice any patterns?
- Colour in all the odd numbers in your answer to part (2).
- Finally, how many presents could he get if he didn't have to move just one step left or right, but could choose any letter from each row?