

6 October 2021

Problem
Solving
Club

Trial &
Error and
Drawing a
Useful
Diagram

Trial and Error



Ex:

Trying different weights of pumpkins

Trying different values of n to make $n^2 - n + 41$ prime

- A good place to start, but not a good place to end
- Unhelpful when the numbers are not small integers
- Works to find an answer, but not all answers

Draw a useful diagram



A Diagram is some sort of
visual representation of a
Problem

- Most useful in Geometry problems, but it can also be used in other areas.
- Use big diagrams with useful and clear labels
Small diagrams are rarely useful

Week 2 – Oct 6



Write a proof for each of the following problems.
(Hint: It's useful to draw a diagram for all of them)

1. A school organized a trip to the Zoo, the Science Centre, and the ROM. 50% of students went to the Zoo, 80% went to the Science Centre, and 90% went to the ROM. 160 students went on all three trips, and everyone else went on exactly 2. How many students are at the school?



2. Determine all values of k where $A(1,2)$, $B(11,2)$, and $C(k,6)$ form a right-angled triangle ABC .

3. Emaan and Lamita play a game with days of the year. Emaan goes first and says "January 1st." Lamita then says a day with either the month or the day the same as Emaan, and the other one higher. For example, Lamita could say "January 7th" or "April 1st" but not "March 3rd." Emaan then says a day following the same rules. This repeats until one player says December 31st, and that player wins. Which player has a winning strategy? (For the purposes of the game, every month has 31 days)

Finding all values of k requires solving a quadratic. If you can't do that yet, find as many values of k as you can.