

Turn in your solution to at least two of the problems. Explain your solution in full sentences. Give detailed reasonings. Include diagrams and figures if appropriate.

**Problem 1.** In our garden we call a line a *tree row* if there are exactly 3 trees on that line. How can we plant 9 trees in the garden to create exactly

- (1) 8 tree rows;
- (2) 10 tree rows?

**Problem 2.** Divide a  $5 \times 5$  paper square into 25 equal small squares along a square grid. Cut out the middle small square. How can we cut the resulting piece of paper into 2 pieces so that we can build a  $2 \times 2 \times 2$  paper cube from the two pieces by folding?

**Problem 3.** We asked a group of 5 people about the number of friends they each had within this group. We got the following answers:

- A: I have 4 friends.
- B: I have fewer friends than A has.
- C: I have as many friends as D has.
- D: I have one fewer friends than E has.
- E: I have an odd number of friends.

Are C and D friends?

**Problem 4.** Solve the inequality  $|x - 1| + |2x - 6| \geq 3$ .