"Standing on the bridge that crosses the river that goes out to the sea
The wind is full of a thousand voices, they pass by the bridge and me
I can see the lights in the distance trembling in the dark cloak of night
Candles and lanterns are dancing, dancing a waltz on all souls night."

In the traditional all souls night celebration, souls of the departed are commemorated by sending candle-lit lanterns on out waterways leading to the oceans, sometimes in little boats. A single lantern represents an individual soul drifting away to the next world. Let's assume the position of a lantern just at the moment of entering the next world is given by the coordinates of a single point in 3-d space. A pair of souls can communicate with each other by straight-lined light rays joining themselves.

As soon as the souls enter afterlife, they are covered by a mysterious veil which separates themselves from the distant living world. The veil should be placed in such a way that the communication beams between any two souls are entirely contained within the veil in order to prevent the living world people overhearing them. Now, as the weavers of heaven are tired of going on knitting veils for an eternity, they ask for your help. You are asked to calculate the minimum surface area of the veil required to cover a group of souls fulfilling the restrictions given above. Help Heaven!

Input

The input file will contain multiple test cases. Each case begins with an integer N $(3 < N < 26)$, the number of souls in a group. Each of the following N lines contains 3 integers giving the x, y and z coordinates of a single soul $(-100 \leq x, y, z \leq 100)$. They will be positioned in such a way that there won't be more than 3 souls in any polygonal face of the veil. The end of input will be marked by a case with $N = 0$. This case should not be processed.

Output

For each test case, print a line in the format, '`Case` X`:` Y', where X is the case number & Y is the minimum required surface area of the veil. Print 2 digits after the decimal point for Y.

Sample Input

```
4
0 0 0
4 0 0
0 4 0
0 0 4
0
```

Sample Output

```
Case 1: 37.86
```