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## 4. Goldbach's Conjecture

**Program Name:** Goldbach.java

**Input File:** goldbach.dat

Goldbach's conjecture can be expressed as follows: Every even integer greater than or equal to 4 can be expressed as the sum of two prime integers. This conjecture has neither been proved nor disproved. [Note: An integer is considered prime if it is divisible only by 1 and the integer itself. The number 1 is not considered prime in this definition.]

In this problem you will be presented with several even integers greater than 4. For each even integer you will write the unique pairs of prime integers that add up to that even integer. The pairs have to be unique, i.e. if you find a pair (p1, p2) then you cannot claim that (p2, p1) is another pair that add up to that even integer.

### Input

The first line will contain a single integer  $n$  that indicates the number of even integers greater than 4 that follow. The next  $n$  lines will each contain a single even integer greater than 4. There will be no even integer greater than 100.

### Output

For each even integer you will write out all the unique pairs of prime numbers that add up to that number.

### Example Input File

```
3
8
20
42
```

### Example Output to Screen

```
8 = 3 + 5
20 = 3 + 17 = 7 + 13
42 = 5 + 37 = 11 + 31 = 13 + 29 = 19 + 23
```