Pythagoras discovered that a musical *interval*—two audible frequencies played simultaneously—is *harmonious*—makes a most pleasing sound—if the ratio of the frequencies is a simple fraction. For example, an interval whose frequency ratio is 2/1 is known as an *octave*. An *equal-tempered chromatic scale* is an increasing geometric series of 13 frequencies, such that the 13th and 1st frequencies form an octave and the ratio of each frequency to the previous one is constant. These days, piano strings are tuned so that pressing 13 successive (black and/or white) keys plays an equal-tempered chromatic scale. Each row in the following table shows a harmonious interval ratio, the name by which musicians refer to the interval, and the two positions in an equal-tempered chromatic scale that approximate the interval:

ratio	interval name	approximate chromatic scale positions
1/1	unison	1st and 1st
6/5	minor third	4th and 1st
5/4	major third	5th and 1st
4/3	perfect fourth	6th and 1st
3/2	perfect fifth	8th and 1st
8/5	minor sixth	9th and 1st
5/3	major sixth	10th and 1st
2/1	octave	13th and 1st

This program will compute frequencies in a equal-tempered chromatic scale and the harmonious intervals that they approximate.

Input Format

Each line of the input contains a single positive integer that is the 1st frequency in an equal-tempered chromatic scale.

Output Format

For each line of the input, compute the frequencies in a equal-tempered chromatic scale having the given 1st frequency, and also compute what the 1st, 4th, 5th, 6th, 8th, 9th, 10th and 13th frequencies would be if they formed harmonious Pythagorean intervals with the 1st frequency. Compute all frequencies accurate to four decimal places and format the output as shown in the output sample.

Input and Output Sample

see reverse side of this page

Input Sample

```
264
440
```

Output Sample

```
    equal   pythagorean
 264.0000   264.0000
 279.6983
 296.3300
 313.9507   316.8000
 332.6192   330.0000
 352.3977   352.0000
 373.3524
 395.5531   396.0000
 419.0739   422.4000
 443.9933   440.0000
 470.3945
 498.3656
 528.0000   528.0000

    equal   pythagorean
 440.0000   440.0000
 466.1638
 493.8833
 523.2511   528.0000
 554.3653   550.0000
 587.3295   586.6667
 622.2540
 659.2551   660.0000
 698.4565   704.0000
 739.9888   733.3333
 783.9909
 830.6094
 880.0000   880.0000
```