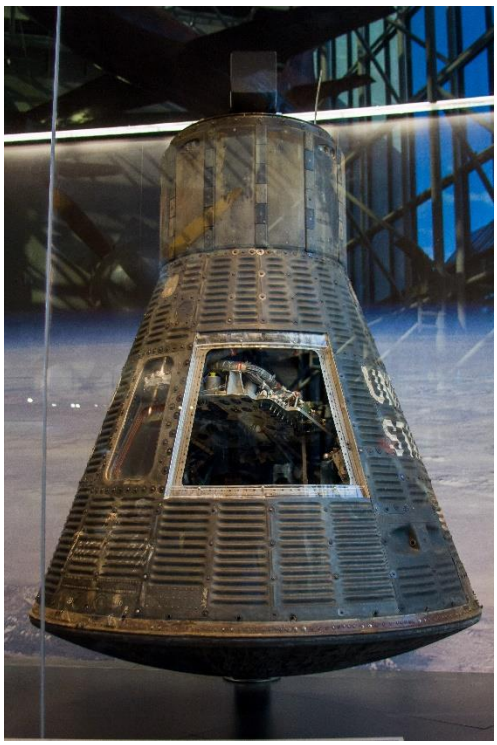
Problem 94: Around and Around



Difficulty: Easy

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Problem Background

In 1962, John Glenn completed a historic spaceflight, orbiting the Earth three times in a small spacecraft. This flight was one of many that paved the way for an era of space exploration, eventually leading to the moon landings just seven years later. Despite the seemingly simple nature of Glenn's flight, it still required very precise calculations to ensure that he remained in orbit and didn't either fly off into space or come crashing back to Earth.

Objects in orbit don't remain in space simply because they've left Earth's atmosphere; they're still constantly falling towards Earth. The reason they stay in space is because they're moving so fast that they continually "miss" the Earth as they fall. In the case of John Glenn's historic flight, he was moving at an orbital speed of 17,544 miles per hour (28,234.8 kilometers per hour). This is fast enough to travel from New York to London in less than 12 minutes. During his entire flight, which lasted just short of five hours, Glenn travelled a total distance of 75,679.3 miles (121,794 kilometers).

Your task today is to determine how far an object in orbit at a particular height will travel during a single orbit of Earth.

Problem Description

Your program will be given the altitude of an object orbiting around Earth at the equator. Using this information, your program must calculate the total distance travelled by that object during a single orbit. It will help you to know that the circumference of the Earth at the equator is 40,075 kilometers.

Sample Input

The first line of your program's input, received from the standard input channel, will contain a positive integer representing the number of test cases. Each test case will consist of a single line, including an integer representing the object's altitude above the Earth's sea level in kilometers. Altitudes will be greater than or equal to 160 (the lowest possible orbital height for Earth).

```
3
160
200
265
```

Sample Output

For each test case, your program must output the distance travelled by an object orbiting around the equator at the given altitude in kilometers. Each value should be rounded to the nearest tenth of a kilometer (one decimal place).

```
41080.3
41331.6
41740.0
```