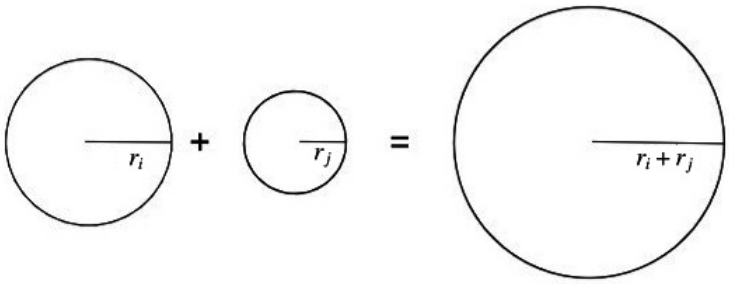
Colliding Circles

There are n circular organisms with radii $r_0, r_1, \cdots, r_{n-1}$. During each second, two organisms with radii r_i and r_j (chosen randomly and equiprobably) collide to form a new, bigger organism with radius $r_i + r_j$.



Given the radii for n creatures and an integer, k, print a single floating-point number denoting the expected total area of all the creatures after k seconds.

Input Format

The first line contains two space-separated integers describing the respective values of n and k.
The second line contains n space-separated integers describing the respective values of $r_0, r_1, \cdots, r_{n-1}$.

Constraints

- $1 \leq n \leq 10^5$
- $0 \leq k \leq n - 1$
- $1 \leq r_i \leq 10^4$
- An answer is considered to be correct if it has a *relative* error of at most 10^{-9}.

Output Format

Print a single floating-point number denoting the expected sum of the creatures' areas after k collisions.

Sample Input 0

```
3 1
1 2 3
```

Sample Output 0

```
67.0206432766
```

Explanation 0

We have $n = 3$ organisms with radii in $\{1, 2, 3\}$. After $k = 1$ second, one collision takes place; there are three possible configurations:

1. $\{1, 2, 3\} \xrightarrow{1+2} \{3, 3\}$, $area = \pi \cdot 3^2 + \pi \cdot 3^2 = 56.548667764$
2. $\{1, 2, 3\} \xrightarrow{1+3} \{2, 4\}$, $area = \pi \cdot 2^2 + \pi \cdot 4^2 = 62.831853071$
3. $\{1, 2, 3\} \xrightarrow{2+3} \{1, 5\}$, $area = \pi \cdot 1^2 + \pi \cdot 5^2 = 81.6814089936$

We then print the expected total area taken up by the two remaining organisms, which is

$\frac{56.548667764+62.831853071+81.6814089936}{3} \approx 67.020643276$.

Sample Input 1

```
3 2
1 2 3
```

Sample Output 1

```
113.0973355292
```

Explanation 1

We have $n = 3$ organisms with radii in $\{1, 2, 3\}$. After $k = 2$ seconds, two collisions take place and we're left with one circle that has a radius of 6. We then print the total area taken up by the remaining organism, which is $\pi \cdot 6^2 = 113.0973355292$.