Write a program `toss()` which tosses a coin and outputs “heads” if the toss is heads and “tails” if the toss is tails.

```
tosscoin()
    x: = 2*rand()
    if rounddown(x) = 0, output “heads”
    if rounddown(x) = 1, output “tails”
```

Write a program which tosses a coin \( n \) times and outputs the number \( x \) of heads.

```
numheads(n)
    x: = 0
    for k = 1 to n {
        y: = tosscoin()
        if y = “heads” then x: = x+1
    }
    output x
```

Note if a binomial experiment with probability \( p \) is done 10000 times (enough to get an approximation accurate to 2 decimal places), then the expected number of successes is \( x = p10000 \). Solve for \( p \). Thus, given \( x \) successes, the expected probability is \( p = x/10000 \).

Write a program `binomialprob(k, n)` which calculates (approximately) the probability \( p \) of getting \( k \) heads in \( n \) tosses.

```
binomialprob(k, n)
    x: = 0
    for i = 1 to 10000 {
        y: = numheads(n)
        if y = k then x: = x+1
    }
    p: = x / 10000
    output p
```

Write a program `doubleroll()` which rolls a pair of dice and outputs the total number of dots which come up.

Write a program `twodiceprob(k)` which, for \( k = 1, 2, ..., 6 \), (approximately) calculates the probability of getting \( \leq k \) dots if a pair of dice is rolled.