

Copy Machine Problem: With 100 people, what are the odds that two people share the same four-digit passcode?

Procedure: Solve the problem finding the odds that two people do not share the same passcode, then find the complement of that result. With 10,000 possible passcodes (0000-9999) two people would have a 9999/10000 chance of not having the same, three people would have $9999/10000 * 9998 / 10000$ chance, etc. This is an implementation of the Pi function, similar to the Sigma function in Maple and in calculus.

```
> n := 1:
  for i from 1 to 100 do
    n := n * ((10001 - i) / 10000)
  end do:
  evalf(1-n);
```

What about 150 people? 200 people? Simply change the 100 above to reflect changes.