

Exercise 6. Let F be the set of real numbers with decimal representation consisting of all fours (and possibly a single decimal point). Examples of numbers contained in F are 4, 44, 444444, 44.4, 4.444444, etc.

Let G be the set of real numbers with decimal representation consisting of all fours or sixes (and possibly a single decimal point). Examples of numbers contained in G are 4, 6, 44, 66, 46, 64, 44646464, 46.46, 6.644464, 646.64646464, 446.66666666, . . . etc.

The set F is countable and the set G is not countable.

- O The sets F and G are both countable.
- O The set G is countable and the set F is not countable.
- O The sets F and G are both not countable.

1) We can can't them. There is a bijection between this set and the set of rational nb.

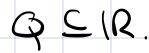
p => position of the dot

q => number of 4

2) We can use Canthar Alphabet of more than 1 coracther of nginite length.

Exercise 7. Which of the following statements is incorrect?

- O The Cartesian product of finitely many countable sets is countable.
- Any subset of infinite cardinality of an uncountable set is uncountable.
- $\bigcirc N \cup \{x \in \mathbf{R}, 0 < x < 1\}$ is uncountable.
- O The intersection of two uncountable sets can be countably infinite.



Exercise 8.

```
function f1() {
  x=0
  i=1
  while (i ≤ n) {
    x=x+1
    i=x+x
  }
  a=x
}
```

```
function f2() {
   y=0
   j=1
   while (j \le n) {
     y=y+1
     j=y*y
   }
   b=y
}
```

After execution of the two program fragments f1 and f2, it is the case that

$$\bigwedge a \approx \frac{n}{2}, b \approx \sqrt{n}.$$

- $\bigcirc a \approx n, b \approx \log_2(n).$
- $\bigcirc a \approx \frac{n}{2}, b \approx \log_2(n).$
- $\bigcirc a \approx n, b \approx \sqrt{n}.$

$$i = 2x$$