Black-box test case design

You are a tester who will create a set of test cases that will be used later to guide the implementation of software according to a specification. For each of the examples below, select a test case design method and use it to define a minimal set of test cases (according to that method). Justify your choice of method, and describe any assumptions you make about the behavior or implementation of the software. Your job as a tester is to scrutinize not only implementations, but also the details about how software is supposed to work, and how to verify that which is assumed.

Points are given for:

* The selection of an appropriate method to devise test cases, with a justification of the choice of method

* Reasonable assumptions about the software that *do not remove crucial features* about the software

* A clear description of the test cases, derived using your selected test case selection method.

1.

The Swedish Tax Authority Skatteverket has the following rule for paying road user charges (tolls) for foreign heavy vehicles, simplified for this question:

"[The toll] depends on what distance you are intending to drive on a toll road, the emission category of your vehicle (EURO 0, 1 or 2) and the number of axles of the truck or truck/trailer combination. You can pay for day [or week]. For more details, please see the [tariff table below].

Note that the chargeable period for day is 00.00-24.00. So, if a journey on a toll road begins, for example, at 21.30 on one day and finishes at 02.30 next day, payment for two days is required.

Tolls are paid in SEK."

Toll Tariff 2014

Max axles	3	3	3	4	4	4
Emission Class	0	1	2 or cleaner	0	1	2 or cleaner
1 day	67	67	67	67	67	67
1 week	220	194	169	347	313	279

2.

The Swedish Social Security Office (Försäkringskassan) provides housing allowances (bostadsbidrag) to individuals and households based on some selection criteria.

The specification of the criteria reads as follows:

If you are between the ages of 18 and 28 and live alone, you can receive housing allowance if your income is less than SEK 86,730/year. If you are married or cohabiting and you are both between the ages of 18 and 28, you can jointly receive housing allowance if you together have an income that is less than SEK 103,720/year.

The implementation is known to contain a single interface with a specification that looks as follows:

```java
public interface HousingAllowanceCheck {
        boolean eligibleForAllowance(Person p);
}
```

Make reasonable assumptions about the properties of the class `Person` in order to test the specification given.

3. Assume that you have a 2D strategy game that shall determine on which map tile a user has clicked. There is a method `Tile getTile(int x, int y)` that is supposed to map user input to correct tiles. A tile represents a square of width X pixels. Assume a limited set of tiles on the map, some of which are visible on the screen.