```
l1: if y = 0 goto l2
    q := x / y
    t := q * y
    r := x - t
    x := y
    y := r
    goto l1
l2: return x
```

Exercise 1: Control flow

(a) Construct the control flow graph for the intermediate code on the left.

(b) Show the control flow graph with basic blocks.

Exercise 2: Live variable analysis

(a) When is a variable considered live?

(b) What is the information that live variables analysis calculates and associates with each control flow graph node?

(c) Is live variable analysis a *may* or *must* analysis?

```
int x = 0;
if(y > 0) {
  x = 1;
} else {
  y = 0;
}
return x;
```

(d) Given the above MiniJava method body, provide the live variables analysis result per line of code. Explain where the analysis result demonstrates the analysis property (may or must) you answered above.

(e) What information does live variables expose at assignments, and how can this be used for optimisation?