Concolic Testing Exercise

In this exercise you should use concolic testing to test the C# method `lcd` (see Fig. 1), that computes the least common denominator of two input values. Provide the details of the analysis that are necessary to compute the answer, i.e., prefixes, prefix feasibility (sat/unsat), input values if any, path conditions if any, test results (pass/fail) if any, in Tab. 1.

Please note the following:

- Assume a concolic testing tool that solves all satisfiable constraints with the smallest possible input values.
- Assume arbitrary, initial inputs `a = 3`, `b = 3`.
- Method `Math.Floor` cannot be encoded symbolically.

```
1  public static int lcd(int a, int b)
2  {
3    Contract.Requires(0 < a && 0 < b);
4
5    if (a == b)
6    {
7        return a;
8    }
9    if (a % b == 0)
10   {
11       return a;
12   }
13   if (b % a == 0)
14   {
15       return b;
16   }
17   int i = 1, t = 0;
18   while (i < b)
19   {
20       int f = (int)Math.Floor((double)i * a / b);
21       if (0 < f)
22       {
23           t = t + f;
24       }
25       i++;
26   }
27   int gcd = 2 * t + a + b - (a * b);
28   return (a * b) / gcd;
29 }
```

FIGURE 1: Method `lcd`.

TABLE 1: Concolic testing.

Step	Prefix	Prefix feasibility	Input	Path condition	Test result
0	`[]`	sat	`a = 3`, `b = 3`		
1					
2					
3					
4					
5					
6					
7					
8					