{% note info %}
摘要
Title: 878. 线性同余方程
Tag: exgcd
Memory Limit: 64 MB
Time Limit: 1000 ms
{% endnote %}

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Link

@TOC

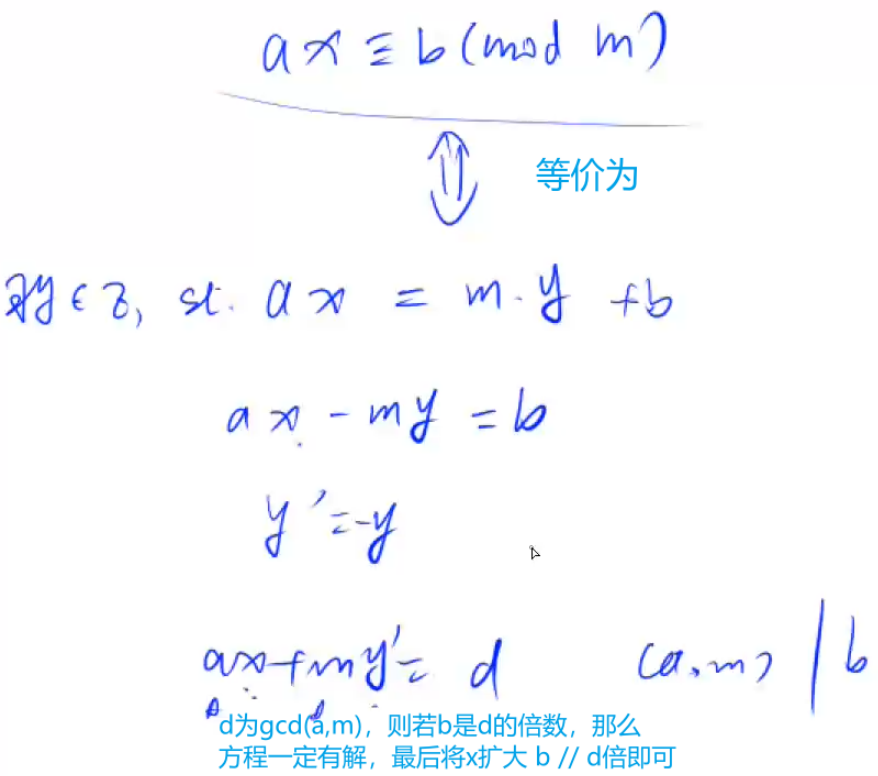
878. 线性同余方程

- **题意**

  > 给定 n 组数据 ai,bi,mi，对于每组数求出一个 xi，使其满足 $ai×xi≡bi(modmi)$，如果无解则输出 $impossible$。

- **思路**

定理：对于方程式$ax+by=d$，$d|gcd(a,b)$是方程一定有整数解的充分必要条件



- **代码**

```
'''
Author: NEFU AB-IN
Date: 2022-03-11 15:18:46
FilePath: \ACM\Acwing\878.py
LastEditTime: 2022-03-11 15:18:47
'''

def exgcd(a, b):
    global x, y
    if b == 0:
        x, y = 1, 0
        return a

    d = exgcd(b, a % b)
    x, y = y, x
    y -= (a // b) * x
    return d

for _ in range(int(input())):
    a, b, m = map(int, input().split())
    x, y = 0, 0
    d = exgcd(a, m)
```

```
    if b % d == 0:
        print(x * b // d % m)
    else:
        print("impossible")
```