

```
1 struct pt {
2     ll x,y;
3     pt(): x(0), y(0) {}
4     pt(ll x, ll y): x(x), y(y) {}
5     pt operator +(pt q){ return pt(x + q.x, y + q.y); }
6     pt operator -(pt q){ return pt(x - q.x, y - q.y); }
7     ll operator *(pt q){ return x * q.x + y * q.y; }
8     ll operator %(pt q){ return x * q.y - y * q.x; }
9     bool operator ==(pt q) const { return (x==q.x && y==q.y); }
10    bool operator !=(pt q) const { return (x!=q.x || y!=q.y); }
11 };
12 ostream& operator<<(ostream& os, const pt& p) {
13     os << "(" << p.x << ", " << p.y << ")";
14     return os;
15 }
```