### simpson 自适应积分

#define LD long double   
   
   
LD simpson(LD l, LD r) {   
LD c = (l + r) / 2;   
return (f(l) + 4 \* f(c) + f(r)) \* (r - l) / 6;   
}   
LD asr(LD l, LD r, LD eps, LD S) {   
 LD m = (l + r) / 2;   
 LD L = simpson(l, m), R = simpson(m, r);   
 if (fabs(L + R - S) < 15 \* eps) return L + R + (L + R - S) / 15;   
 return asr(l, m, eps / 2, L) + asr(m, r, eps / 2, R);   
}   
   
LD asr(LD l, LD r, LD eps) { return asr(l, r, eps, simpson(l, r)); }