HOMEWORK 20
DISCRETE MATHEMATICS I
DUE 04-16 (NOT ~~04-18~~)

(1) Suppose that using the Euclidean algorithm on the numbers a and b gives a table that looks like:

Q	R	S	T
	a	1	0
	b	0	1
$\vdots$	$\vdots$	$\vdots$	$\vdots$
q_{n-2}	r_{n-2}	s_{n-2}	t_{n-2}
q_{n-1}	r_{n-1}	s_{n-1}	t_{n-1}
q_n	r_n	s_n	t_n

(a) Write formulæ for r_n, s_n, and t_n in terms of r_{n-2} and r_{n-1}, s_{n-2} and s_{n-1}, t_{n-2} and t_{n-1}, and q_n.

(b) Suppose that you already know that

$$r_{n-2} = as_{n-2} + bt_{n-2}$$

and

$$r_{n-1} = as_{n-1} + bt_{n-1}.$$

Prove that

$$r_n = as_n + bt_n.$$

- **Eight** book problems: #3.1.21, 40, 42; #3.2.5, 15, 24, 26, 27.