Today The class P; CYK algorithm. §7.2.
Next class The class NP, and NP-completeness. §§7.3–4.

1. List the members of your group below. Underline your name.

2. Trace Euclid's algorithm to compute the GCD of 3838 and 19302.

3. Prove or disprove each: The class P is closed under

   (a) complement.

   (b) union.

   (c) concatenation.

4. The operation of the algorithm of Theorem 7.16 (CYK) on the following grammar with and string `000#111` is depicted by the table on the right below.

$$
\begin{array}{rcl}
S_0 & \to & \#|N_2N_0 \\
B & \to & \# \\
N_0 & \to & S_0N_4 \\
N_2 & \to & 0 \\
N_4 & \to & 1
\end{array}
$$

$i\backslash j$	1	2	3	4	5	6	7
1	$\{N_2\}$	$\emptyset$	$\emptyset$	$\emptyset$	$\emptyset$	$\emptyset$	$\{S_0\}$
2		$\{N_2\}$	$\emptyset$	$\emptyset$	$\emptyset$	$\{S_0\}$	$\{N_0\}$
3			$\{N_2\}$	$\emptyset$	$\{S_0\}$	$\{N_0\}$	$\emptyset$
4				$\{S_0, B\}$	$\{N_0\}$	$\emptyset$	$\emptyset$
5					$\{N_4\}$	$\emptyset$	$\emptyset$
6						$\{N_4\}$	$\emptyset$
7							$\{N_4\}$

Depict a similar table for the operation of the algorithm on string `a+a*(a+a)` and grammar:

```
S0 -> N19 N0 | S0 N1 | a | term N2
N0 -> S0 N10
N1 -> N11 term
factor -> N19 N0 | a
term -> N19 N0 | a | term N2
```

```
N10 -> )
N11 -> +
N12 -> *
N19 -> (
N2 -> N12 factor
```