

## Algorithm Efficiency

Assume that the function  $g(n)$  is the time required to run Algorithm A.

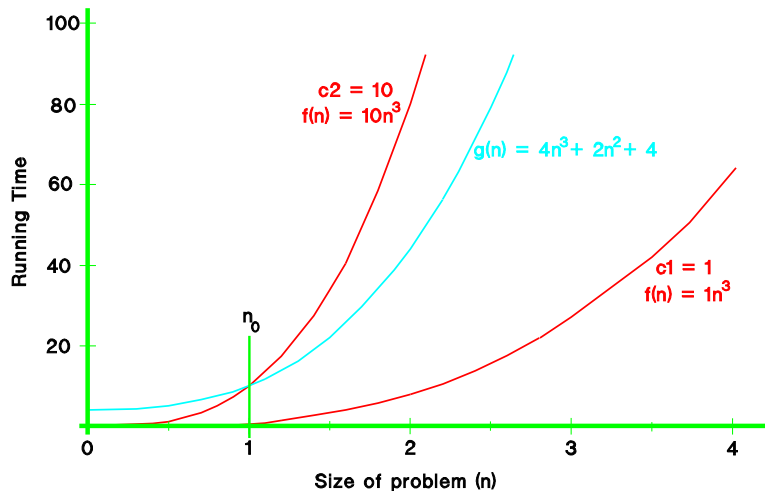
An algorithm A is said to be "of order  $f(n)$ ," denoted by  $O(f(n))$ , if constants  $c_1$ ,  $c_2$ , and  $n_0$  can be found such that:

$$c_1 * f(n) < g(n) < c_2 * f(n)$$

for a problem of size  $n > n_0$

ORDER001

## Order Analysis Example



ORDER010

## Order Analysis Example

- [ A: initialization code executed once
- [ while iteration; no. of iterations depends on n
  - [ B: linear sequence of stmts
    - [ while iteration, dependent on n
      - [ C: linear sequence
    - [ D: linear sequence
  - [ E: linear sequence
- [ while iteration, not dependent on n
  - [ F: linear sequence

ORDER002