PL 26 (Teollisuuskatu 23)
00014 HELSINGIN YLIOPISTO

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1. Show why $3n^2 + 7n + 21 = \mathcal{O}(n^3)$, but $3n^2 + 7n + 21 \neq \Theta(n^3)$.

2. Analyze order of growth of the running time of following program.

```
1  for i ←1 to m do
2      if odd(i) then
3          for j ←i to m do x ←x+1
4          for j ←1 to i do y ←y+1
```

   where function *odd*(i) returns true when i is odd.

3. Analyze the $\mathcal{O}$-notation based time complexity of following program:

```
y ← count(k)
print(y)
```

   subroutine is defined as follows:

```
count(m)
    if m = 1 then return 1
    x ←0
    for i ←1 to m do
        x ←x+1
    return x * count(m-1)
```