

---

## Homework #1

Please submit a separate document with your answers.

- 1) Assume an algorithm has  $f(n)$  number of steps. What is the running time proportional to in big-O notation?
  - a)  $f(n) = 4n + 12$
  - b)  $f(n) = n^3 + 6$
  - c)  $f(n) = 120$
  - d)  $f(n) = n^2 - 7$
  - e)  $f(n) = n^4 + 50n^2 + 20$
  - f)  $f(n) = n$
- 2) For each of the following code blocks, determine the running time in big-O notation.

```
//a
for i from 1 to n
  ▶ sum += i
```

```
//b
for i from 1 to n
  ▶ for j from 1 to n
  ▶   ▶ transposedMatrix[i][j] = matrix[j][i]
```

```
//c
x += 1

for i from 1 to n
  ▶ x += 1

for i from 1 to n
  ▶ for j from 1 to n
  ▶   ▶ x += 1
```

```
//d
if n < 4
  ▶ print n
else
  ▶ for i from 1 to n
  ▶   ▶ print array[i]
```

```
//e
for (i = 1; i < n; i *= 2)
  ▶ print i
```