Quiz – Time complexity

Total points 3

1.

Question 1 (1 pt)

```
n = int(input())
m = int(input())
k = int(input())
correctTriples = 0
for i in range(n):
  for j in range(m):
    for g in range(k):
      if (i + j + g) % 3 == 0:
        correctTriples += 1

print(correctTriples)
```

Choose the best possible bound on the running time of the code above

1 point

O

$O(nm^2k)$

O

$O(n^2mk)$

O

$O(nmk)$

O

$O(nm)$

O

$O(n)$

2.

Question 2

We could imagine several versions of the problem which the solution above solves — depending on actual bounds on the variables and the time limit, this solution may pass or not. Check **those versions** where the solution from the previous question is likely to pass.

1 point

☐

n=2000, m=1000, k=1000, time limit = 0.5 seconds

☐

n=2000, m=20, k=500, time limit = 10 seconds

☐

n=1000000, m=100, k=100, time limit = 2 seconds

☐

n=m=k=100, time limit = 2 seconds

3.
Question 3
Below you see a function, which calculates a certain value from an array. Could you make it faster so it still returns the same value? Assume that the array has no more than 100 000 elements. Explain

1 point

```
def calculate(a):
 result = 0

 for x in a:
  sum = 0
  for y in a:
   sum += y
  result += sum * x

 return result
```