

# Quiz 2: Asymptotic Run Times and Solving Recurrence Relations

**Due** Oct 6, 2022 at 4:30pm**Points** 10**Questions** 5**Available** Oct 6, 2022 at 8am - Oct 6, 2022 at 4:30pm 8 hours and 30 minutes**Time Limit** 25 Minutes

This quiz is no longer available as the course has been concluded.

## Attempt History

	Attempt	Time	Score
LATEST	<a href="#">Attempt 1</a>	25 minutes	6 out of 10

⚠ Correct answers are no longer available.

Score for this quiz: **6** out of 10

Submitted Oct 6, 2022 at 8:31am

This attempt took 25 minutes.

### Question 1

**1 / 1 pts**

True or false:  $4n^2 - 103n + 6 \in O(n!)$

☒ True

☐ False

### Question 2

**1 / 1 pts**

True or false:  $O(17n^2 + 4n - 13) = O(n^2)$

☒ True

☐ False

### Question 3

1 / 1 pts

True or false:  $4n^2 - 103n + 6 \in \Theta(n)$

☐ True

☒ False

Incorrect

### Question 4

0 / 2 pts

Prove that  $3\sqrt{n} - 5 \in \Omega(\sqrt{n})$  by providing the appropriate values for constants  $c$  and  $n_0$ . Choose the largest integral value possible for  $c$ . Note that you may want to square both sides of your inequality to make the math easier.

$c =$

$n_0 =$

Answer 1:

Answer 2:

18

Partial

## Question 5

1 / 5 pts

Use the 5-step method shown in class:

- 2 backwards substitutions
- 1 general form of the recurrence
- Use of the initial condition
- Final answer

Solve the following recurrence relation:

$$T(n) = T(n-1) + 2n \text{ for all } n > 0, T(0) = 0$$

Show the 5 steps; 1 point will be given for each correct response.

step 1:

step 2:

step 3:

step 4:

step 5:

Answer 1:

$$T(n-2)+2n+2(n-1)$$

Answer 2:

$$T(n-3)+2n+2(n-1)+2(n-2)$$

**Answer 3:**

$$T(n-i)+2i(n-1)$$

**Answer 4:**

$$i=n$$

**Answer 5:**

$$2n^2+2n$$

Quiz Score: **6** out of 10

This quiz score has been manually adjusted by +2.0 points.