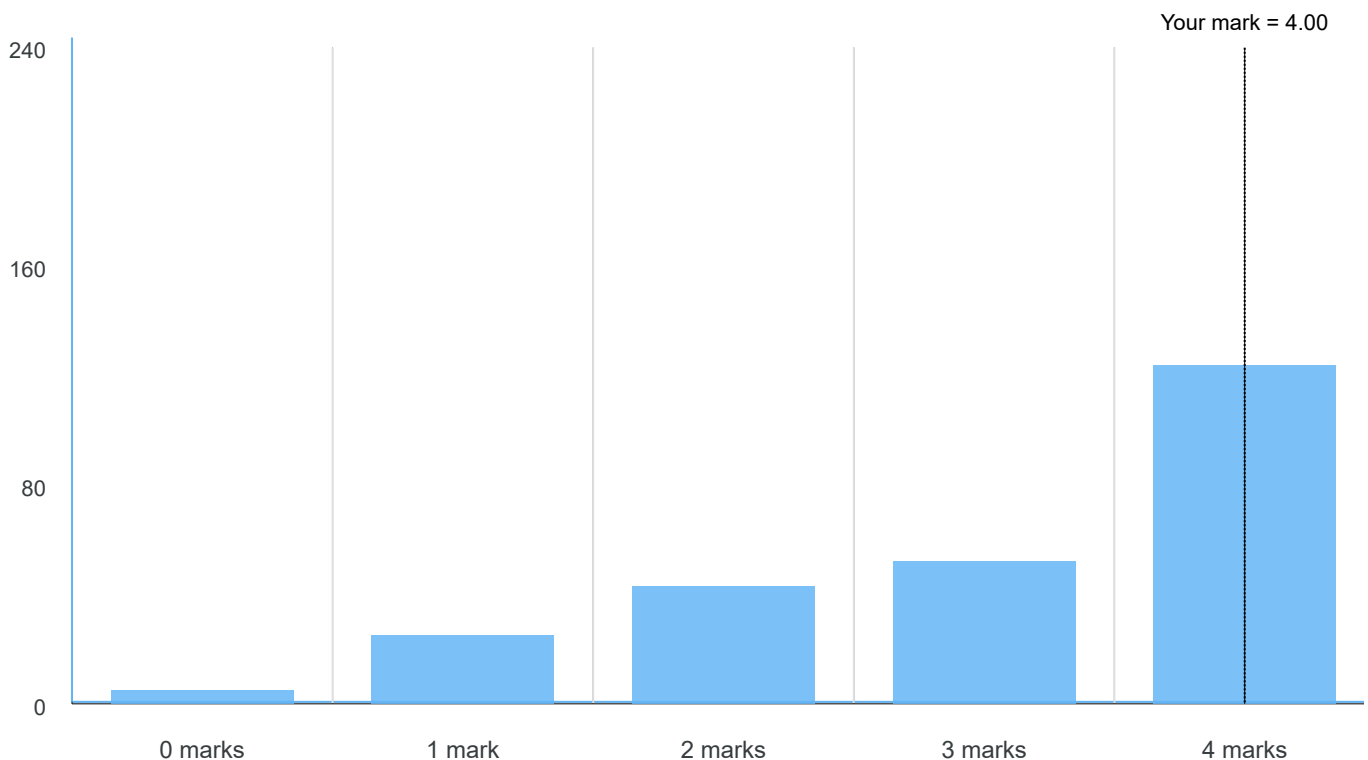


Quiz 6

Student Mark Distribution



Your Individual Results

Deadline	Monday, 14 October 2019 at 4:00PM
Latest Submission	Monday, 14 October 2019 at 2:12PM
Raw Mark	4.00/5.00 (80.00%)
Late Penalty	N/A
Final Mark	4.00/5.00 (80.00%)

Question 1 (1 mark)

Let $A = \begin{pmatrix} 3 & 1 \\ 4 & 1 \end{pmatrix}$

Which of the following matrices is $A \cdot A - 2A^T$?

(a) <input type="radio"/>	$\begin{pmatrix} 7 & 2 \\ 8 & 3 \end{pmatrix}$
(b) <input checked="" type="radio"/>	$\begin{pmatrix} 7 & -4 \\ 14 & 3 \end{pmatrix}$
(c) <input type="radio"/>	$\begin{pmatrix} 3 & -1 \\ 8 & -1 \end{pmatrix}$
(d) <input type="radio"/>	$\begin{pmatrix} 3 & -7 \\ 14 & -1 \end{pmatrix}$
(e) <input type="radio"/>	None of the above

✓ Your response was correct.

Mark: 1.00

Question 2 (1 mark)

Which of the following functions are in $O(n^2)$. Select all that apply

(a) <input checked="" type="checkbox"/>	$2n^2 - 3n + 5$
(b) <input checked="" type="checkbox"/>	$\log(n^3) + 5n$
(c) <input checked="" type="checkbox"/>	$ n $
(d) <input checked="" type="checkbox"/>	$(1.1)^{\log n}$
(e) <input checked="" type="checkbox"/>	$\sin(n)$
(f) <input checked="" type="checkbox"/>	$f \circ g(n)$ where $f(n) = \sqrt{n}$ and $g(n) = 2n^4 - 3n^2 + 1$

✓ Your response was correct.

Mark: $\max(0.17 + 0.17 + 0.17 + 0.17 + 0.17 + 0.17, 0) = 1.00$

Question 3 (1 mark)

Suppose $f(n) \in O(g(n))$ and $h(n) \in O(k(n))$.

Which of the following are true for all f, g, h, k . Select all that apply

(a) <input type="checkbox"/>	$g(n) \in O(f(n))$
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(b) <input checked="" type="checkbox"/>	$k(n) \in \Omega(h(n))$
(c) <input checked="" type="checkbox"/>	$f(n) + h(n) \in O(g(n) + k(n))$
(d) <input type="checkbox"/>	$f(n) - h(n) \in O(g(n) - k(n))$
(e) <input checked="" type="checkbox"/>	$f(n).h(n) \in O(g(n).k(n))$
(f) <input type="checkbox"/>	$f(n)/h(n) \in O(g(n)/k(n))$

✓ Your response was correct.

Mark: $\max(0.33 + 0.33 + 0.33, 0) = 1.00$

Question 4 (1 mark)

Order the following functions in **increasing** asymptotic complexity

<input type="checkbox"/> $(6n^2 - 2n + 5) \text{ div } 8$
<input type="checkbox"/> $n \log(n)$
<input type="checkbox"/> $n\sqrt{n}$
<input type="checkbox"/> $n^2/(\log n)$
<input type="checkbox"/> $(6n^2 - 2n + 5) \% 8$

✗ Your response was incorrect.

The correct response was:

1) $(6n^2 - 2n + 5) \% 8$

2) $n \log(n)$

3) $n\sqrt{n}$

4) $n^2/(\log n)$

5) $(6n^2 - 2n + 5) \text{ div } 8$

Mark: 0.00

Question 5 (1 mark)

Let F denote the set of functions from \mathbb{N} to \mathbb{R} . Define relations R and S on F as follows:

- $(f, g) \in R$ if $f(n) \in O(g(n))$
- $(f, g) \in S$ if $f(n) \in \Theta(g(n))$

Which of the following is true? Select all that apply.

(a) <input checked="" type="checkbox"/>	$R^{\leftarrow} = \{(g, f) : g(n) \in \Omega(f(n))\}$
(b) <input type="checkbox"/>	R is a partial order

(c) <input checked="" type="checkbox"/>	S is an equivalence relation
(d) <input type="checkbox"/>	$R \subseteq S$

✓ Your response was correct.

Mark: $\max(0.50 + 0.50, 0) = 1.00$