Warm-Ups 06

(!) This is a preview of the published version of the quiz

Started: Mar 4 at 12:57pm

Quiz Instructions

Question 1 2 pts

Which of the following are true about little-o and big-O?

```
If f \in o(g) , then f \in O(g)
```

If $f \in o(g)$, then g
otin O(f)

When $f \sim g$ and f
otin o(g) , $f \in O(g)$

When $f \nsim g$ and $f \in o(g)$, $f \in O(g)$

If $f \in O(g)$, then $f \in o(g)$

Question 2 2 pts

Which of these relationships apply for $f(n) = \log_3(n)$ and $g(n) = \log_7(n)$?

Ш

 $f\sim g$

 $f \in o(g)$

 $f\in O(g)$

$$f\in\Theta(g)$$

Question 3 2 pts

If $f \in \Theta(g)$, then which of the following MUST be true?

$$g \in \Theta(f)$$

$$f \in o(g)$$

$$g \in o(f)$$

$$f \in O(g)$$

$$g \in O(f)$$

$$egin{array}{c} \square \ f \sim g \end{array}$$

Question 4 2 pts

If $f \in \Theta(g)$, then which of the following CAN be true?

$$g \in \Theta(f)$$

$$f \in o(g)$$

$$g \in o(f)$$

$$f \in O(g)$$

$$g \in O(f)$$

2

2 of 3 3/4/2024, 12:58 PM $egin{array}{c} \square \ f \sim g \end{array}$

Question 5 2 pts

Consider the quantity $\frac{(2n)!}{2^{2n}(n!)^2}$. This will come up later in the course (it is the probability that in flips of a fair coin, exactly will be Heads). Which of the following formulae is asymptotically equal to this? As a reminder, Stirling's Formula says $n! \sim \sqrt{2\pi n} \left(\frac{n}{e}\right)^n$.

0

 $\frac{1}{\sqrt{2\pi r}}$

0

 $\frac{1}{\sqrt{\pi n}}$

O

 $\sqrt{\frac{2}{\pi n}}$

0

 $\sqrt{2\pi n}$

C

 $2^n\sqrt{2\pi n}$

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