BÀI LUYỆN TẬP TUẦN 1

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Phần 1: Reinforcement

Mo Tu We Th Fr Sa Su

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LT thêm BTH 1

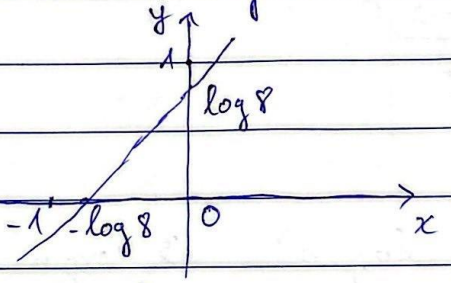
Phần 1. Reinforcement

LR- 4.1.

(1) $f(n) = 8n$

$\log f(n) = \log 8n = \log n + \log 8$

$y = x + \log 8$

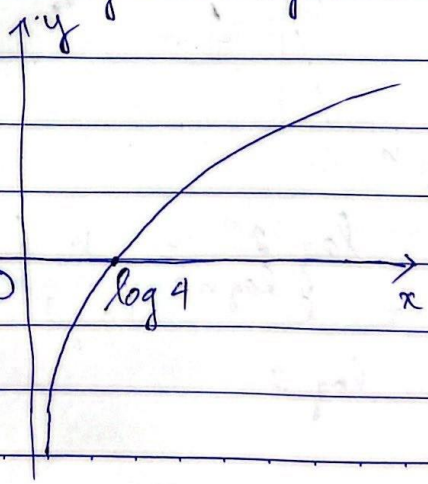


(4) $f(n) = 4n \log n$

$\log f(n) = \log(4n \log n)$

$= \log 4 + \log n + \log(\log n)$

$y = x + \log x + \log 4$



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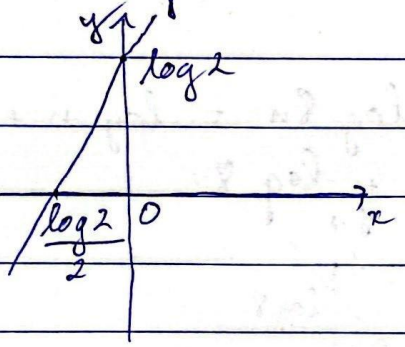
(+) $f(n) = 2n^2$

$\log f(n) = \log 2n^2 = \log 2 + 2\log n$

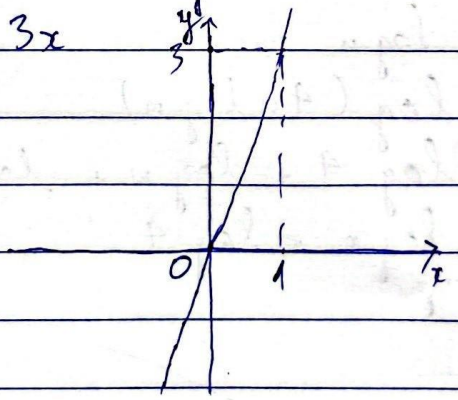
$y = 2x + \log 2$



(+) $f(n) = n^3$

$\log f(n) = \log n^3 = 3\log n$

$y = 3x$



(+) $f(n) = 2^n$

$\log f(n) = \log 2^n = n \log 2$

$= e^{\log n} \cdot \log 2$

$y = e^x \cdot \log 2$

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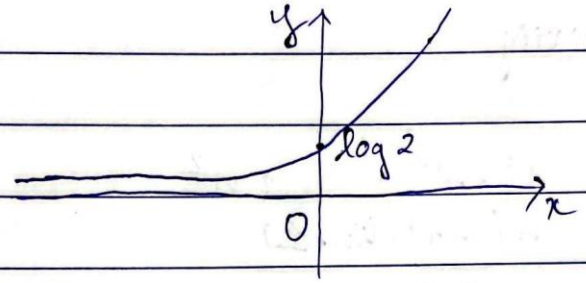

R-4.6

$S = 0 + 2 + 4 + \dots + 2n = \frac{(2n+0)(n+1)}{2} = n(n+1)$

R-4.9 $O(n)$

R-4.10 $O(n)$

R-4.11 $O(n^2)$

R-4.12 $O(n)$

R-4.13 $O(n^3)$

R-4.22

$(n+1)^5 = n^5 + 5n^4 + 10n^3 + 10n^2 + 5n + 1$

$\leq 32 n^5$

$c = 32$

$\Rightarrow O(n^5)$

HẢI TIẾN

Phần 2: Creativity

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Phần 2. Creativity

LC - 9.4

$$\sum_{i=1}^{n} i^2 = 1^2 + 2^2 + \dots + n^2$$

$$= \frac{n(n+1)(2n+1)}{6}$$

$$= \frac{1}{3}n^3 + \frac{1}{2}n^2 + \frac{1}{6}n$$

$$\leq n^3$$

$\Rightarrow c = 1$

$\Rightarrow O(n^3)$

LC - 4.5

$$S = \sum_{i=1}^{n} \frac{i}{2^i} = \frac{1}{2} + \frac{2}{2^2} + \frac{3}{2^3} + \dots + \frac{100}{2^{100}}$$

$$2S = 1 + \frac{2}{2} + \frac{3}{2^2} + \dots + \frac{100}{2^{99}}$$

$$2S - S = 1 + \underbrace{\frac{1}{2} + \frac{1}{2^2} + \dots + \frac{1}{2^{99}}}_{A} - \frac{100}{2^{100}}$$

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$2A = 2 + 1 + \frac{1}{2} + \dots + \frac{1}{2^{98}}$

$2A - A = 2 - \frac{1}{2^{99}}$

$\Rightarrow S = 2 - \frac{1}{2^{99}} - \frac{100}{2^{100}} < 2$

C-4.18

$\sum_{i=1}^{n} \log i = \log 1 + \log 2 + \dots + \log n$

$\leq \log n + \log n + \dots + \log n$

$= n \log n$

$\Rightarrow O(n \log n)$

C-4.6

$S = 1 + 2 + 2^2 + \dots + 2^n$

$2S = 2 + 2^2 + 2^3 + \dots + 2^{n+1}$

$2S - S = 2^{n+1} - 1$

$S = 2^{n+1} - 1$

C-4.9

$\Sigma = (1-1) + (2-1) + (3-1) + \dots + (n-1) + 1$

$= 0 + 1 + 2 + \dots + (n-1) + 1$

$= \frac{n(n-1)}{2} + 1$

HẢI TIẾN