Show All Solutions

Rosen, Discrete Mathematics and Its Applications, 7th edition
Extra Examples
Section 3.2—The Growth of Functions

Extra Examples — *Page references correspond to locations of Extra Examples icons in the textbook.*

---

p.206, icon at Example 1

#1. Give a big-O estimate for each of these functions. Use a simple function in the big-O estimate.

(a) $3n + n^3 + 4$.

(b) $1 + 2 + 3 + \cdots + n$.

(c) $\log_{10}(2^n) + 10^{10}n^2$.

See Solution

---

p.206, icon at Example 1

#2. Use the definition of big-O to prove that $5x^4 - 37x^3 + 13x - 4 = O(x^4)$

See Solution

p.206, icon at Example 1

#3. Suppose we wish to prove that $f(x) = 2x^2 + 5x + 9$ is big-O of $g(x) = x^2$ and want to use $C = 3$ in the big-O definition. Find a value k such that $|f(x)| \leq 3|g(x)|$ for all $x > k$.

See Solution

p.206, icon at Example 1

#4. Use the definition of big-O to prove that $\dfrac{3x^4 - 2x}{5x - 1}$ is $O(x^3)$.

See Solution

p.215, icon at Example 11

#1. Show that the sum of the squares of the first n odd positive integers is of order n^3.

See Solution

p.21, icon at Example 12

#1. Use the definition of big-theta to prove that $7x^2 + 1$ is $\Theta(x^2)$.

See Solution