

Linear Approximation / Linearization Asn't

Due: _____

Show all reasoning possible for full marks

1.

The derivative of the function A is given by $A'(t) = 2 + 9e^{0.4 \sin t}$, and $A(1.2) = 7.5$. If the linear approximation to $A(t)$ at $t = 1.2$ is used to estimate $A(t)$, at what value of t does the linear approximation estimate that $A(t) = 15$?

(A) 0.498

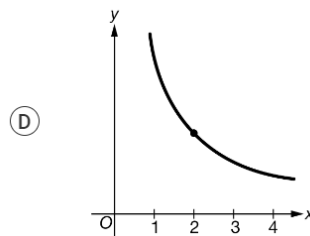
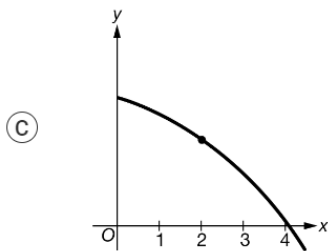
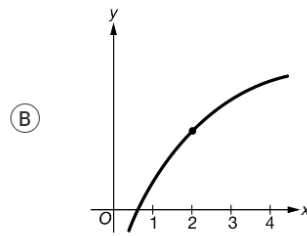
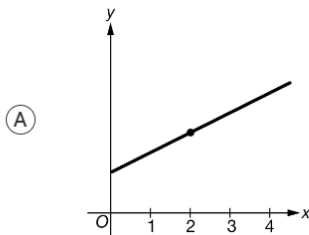
(B) 1.166

(C) 1.698

(D) 2.400

2.

The locally linear approximation of the differentiable function f at $x = 2$ is used to approximate the value of $f(2.3)$. The approximation at $x = 2.3$ is an underestimate of the corresponding function value at $x = 2.3$. Which of the following could be the graph of f ?



3a. What is the Linearization of $y = \sqrt[3]{x}$ at the point $(27, 3)$?

b. Use this linearization to estimate $\sqrt[3]{28.2}$

4.

The line tangent to the graph of the twice-differentiable function f at the point $x = 5$ is used to approximate the value of $f(5.25)$. Which of the following statements guarantees that the tangent line approximation at $x = 5.25$ is an overestimate of $f(5.25)$?

- (A) The function f is decreasing on the interval $5 \leq x \leq 5.25$.
- (B) The function f is increasing on the interval $5 \leq x \leq 5.25$.
- (C) The graph of the function f is concave down on the interval $5 \leq x \leq 5.25$.
- (D) The graph of the function f is concave up on the interval $5 \leq x \leq 5.25$.