

Linear Approximation

Construct $L(x) = f(a) + f'(a)(x - a)$, then use $L(b)$ to estimate $f(b)$. Round only the final estimate to four decimal places.

1. Construct $L(x)$, then estimate $f(b)$.

$f(x) = -x^2 + 3$

$a = 0$

$b = \frac{-1}{20}$

$L(x) =$ _____

Exact $L(b) =$ _____

$f(b)$ approx. _____

2. Construct $L(x)$, then estimate $f(b)$.

$f(x) = 2 \cdot e^x$

$a = -1$

$b = \frac{-19}{20}$

$L(x) =$ _____

Exact $L(b) =$ _____

$f(b)$ approx. _____

3. Construct $L(x)$, then estimate $f(b)$.

$f(x) = \frac{1}{2} \cdot \sin\left(\frac{-1}{2} \cdot x\right) - 1$

$a = -1 \cdot \pi$

$b = -\pi + \frac{1}{20}$

$L(x) =$ _____

Exact $L(b) =$ _____

$f(b)$ approx. _____

4. Construct $L(x)$, then estimate $f(b)$.

$f(x) = -3 \cdot x + x^3 - 3$

$a = 1$

$b = \frac{19}{20}$

$L(x) =$ _____

Exact $L(b) =$ _____

$f(b)$ approx. _____

Linear Approximation

Construct $L(x) = f(a) + f'(a)(x - a)$, then use $L(b)$ to estimate $f(b)$. Round only the final estimate to four decimal places.

5. Construct $L(x)$, then estimate $f(b)$.

$f(x) = -3 \cdot (2)^{-3 \cdot x - 2} + 1$

$a = -1$

$b = \frac{-21}{20}$

$L(x) =$ _____

Exact $L(b) =$ _____

$f(b)$ approx. _____

6. Construct $L(x)$, then estimate $f(b)$.

$f(x) = 2 \cdot \cos\left(\frac{1}{2} \cdot x\right) - 2$

$a = 0$

$b = \frac{-1}{50}$

$L(x) =$ _____

Exact $L(b) =$ _____

$f(b)$ approx. _____

7. Construct $L(x)$, then estimate $f(b)$.

$f(x) = 3 \cdot x - 2 \cdot x^2 + 3 \cdot x^3 + 2 \cdot x^4 - 1$

$a = 2$

$b = \frac{101}{50}$

$L(x) =$ _____

Exact $L(b) =$ _____

$f(b)$ approx. _____

8. Construct $L(x)$, then estimate $f(b)$.

$f(x) = 3 \cdot (3)^{2 \cdot x - 1}$

$a = 1$

$b = \frac{21}{20}$

$L(x) =$ _____

Exact $L(b) =$ _____

$f(b)$ approx. _____