

TANGENT LINE APPROXIMATIONS

AP CALCULUS

Answers
NAME _____

Find the approximation by creating a tangent line at the given point.

1. $f(x) = \sqrt{x+3}$; (1,2) approximate $\sqrt{3.98}$

$$\approx 1.995$$

2. $g(x) = \sqrt[3]{1+x}$; (0,1) approximate $\sqrt[3]{1.1}$

$$\approx 1.0333$$

3. Let f be a function such that $f(1) = 2$ and whose derivative is known to be $f'(x) = \sqrt{x^3 + 1}$

(a) Use a linear approximation to estimate the value of $f(1.1)$

$$f(1.1) \approx 2.141421356$$

(b) Do you think the true value of $f(1.1)$ is less than or greater than your estimate? Why?

Less (you justify)

4. The side of a square is measured to be 10 ft, with a possible error of ± 0.1 ft. Use differentials to estimate the error in the calculated area.

$$\frac{dA}{dt} = \pm 2 \text{ ft}$$