Name: _____

1. Suppose you know that the function f passes through the point $(4, 3)$ and has first derivative

$$f'(x) = \sqrt{x} + 5.$$

(a) Find the equation of the tangent line to the the function $f(x)$ at the point $(4, 3)$.

(b) Use the tangent line (or the equivalent *local linearization*) to approximate $f(4.1)$. Show your work.

(c) Suppose you found out that $f''(4) = 0.25$. What does this tell you about the shape of f near $x = 4$? Does this mean your approximation for $f(4.1)$ is an over estimate or under estimate? Briefly explain.

Name: _____

1. Suppose you know that the function f passes through the point $(3, 1)$ and has first derivative

$$f'(x) = x^2 - x.$$

(a) Find the equation of the tangent line to the the function $f(x)$ at the point $(3, 1)$.

(b) Use the tangent line (or the equivalent *local linearization*) to approximate $f(2.9)$. Show your work.

(c) Suppose you found out that $f''(3) = 2$. What does this tell you about the shape of f near $x = 3$? Does this mean your approximation for $f(3.1)$ is an over estimate or under estimate? Briefly explain.

Name: _____

1. Suppose you know that the function f passes through the point $(2, 6)$ and has first derivative

$$f'(x) = \frac{1}{x}.$$

(a) Find the equation of the tangent line to the the function $f(x)$ at the point $(2, 6)$.

(b) Use the tangent line (or the equivalent *local linearization*) to approximate $f(2.4)$. Show your work.

(c) Suppose you found out that $f''(2) = -0.25$. What does this tell you about the shape of f near $x = 2$? Does this mean your approximation for $f(2.4)$ is an over estimate or under estimate? Briefly explain.

Name: _____

1. Suppose you know that the function f passes through the point $(2, 8)$ and has first derivative

$$f'(x) = 2x - 3x^2.$$

(a) Find the equation of the tangent line to the the function $f(x)$ at the point $(2, 8)$.

(b) Use the tangent line (or the equivalent *local linearization*) to approximate $f(1.9)$. Show your work.

(c) Suppose you found out that $f''(2) = -10$. What does this tell you about the shape of f near $x = 2$? Does this mean your approximation for $f(1.9)$ is an over estimate or under estimate? Briefly explain.