

Lesson 4.3: Approximating with the Tangent Line

Sometimes, finding the value of a function is difficult or even impossible.

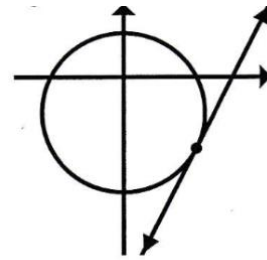
With the use of Calculus techniques, we can _____ the function value by finding a y-value on a line that is _____ to the function.

Since this method involves using a linear function (the tangent line function) at a nearby point, it is sometimes called _____ approximation.

Examples:

1. If $(2, -2)$ is a point on the graph of $x^2 + y^2 + 2y = 4$, use the equation of a tangent line passing through the point $(2, -2)$ to approximate a y-coordinate:

- a. when the x-coordinate is 2.1



- b. when the x-coordinate is 1.9

2. If $f(2) = 3$ and $f'(2) = -2$, use local linearization to approximate $f(2.01)$.