

The Derivative at a Point

While working in a group make sure you:

- Expect to make mistakes but be sure to reflect/learn from them!
- Are civil and are aware of your impact on others.
- Assume and engage with the strongest argument while assuming best intent.

1. Let f be the function whose graph is composed of a semicircle, a curve, and a line given below. *Estimate* the following values.

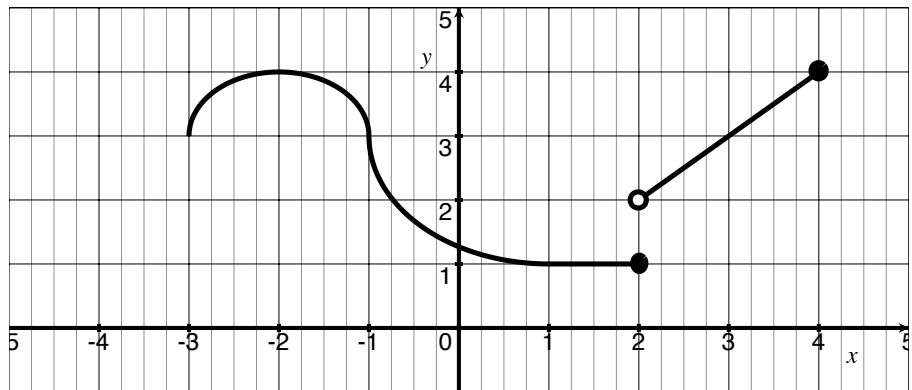
$$f'(3)$$

$$f'(2)$$

$$f'(1)$$

$$f'(0)$$

$$f'(-2)$$



2. Consider the function f defined graphically in problem 1.

- (a) Use your results (and estimates) to find the equation of the line that is tangent to f at $x = 3$.

- (b) Consider the function f defined graphically in problem 1. Use your results (and estimates) to find the equation of the line that is tangent to f at $x = 0$.

3. Let $f(t) = -4.9t^2$ be the distance a grapefruit is from you.

(a) Find $f'(2)$.

(b) Find $\frac{d}{dx}f|_{x=3}$

(c) Generalize? Find $f'(x)$?

4. Could we find $f'(x)$ graphically too? Revisit the graph from the front to estimate the following. Then plot the values of $f'(x)$ on the blank graph below.

$f'(3.5)$

$f'(3)$

$f'(2.5)$

$f'(2)$

$f'(1.5)$

$f'(1)$

$f'(.5)$

$f'(0)$

