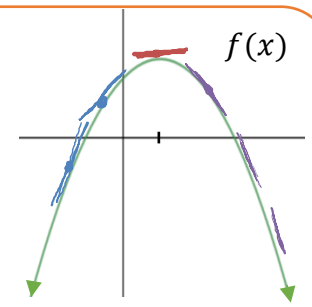
DATE: _____

Sketching the graph of $f'(x)$ from $f(x)$



✸ When $f(x)$ is increasing,
the slopes of the tangent lines for $f(x)$ are positive.

$f(x)$ inc $\rightarrow$ $f'(x) > 0$

✸ When $f(x)$ is decreasing,
the slopes of the tangent lines for $f(x)$ are negative.

$f(x)$ dec $\rightarrow$ $f'(x) < 0$

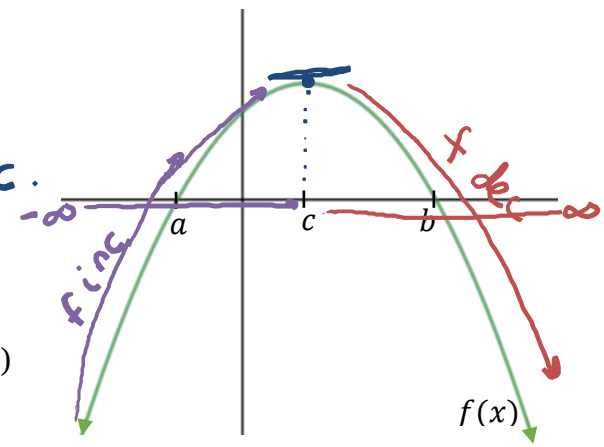
✸ When $f(x)$ is neither increasing nor decreasing,
the slopes of the tangent lines for $f(x)$ are zero or DNE.

$f(x)$ neither inc nor dec, $f'(x) = 0$ or $f'(x)$ DNE

Draw a Sketch of $f'(x)$ given $f(x)$

① Notice when $f'(x) = 0$
(slopes of tangent lines are 0, horizontal tangent lines)

$f'(x) = 0$ @ $x = c$, b/c $f(x)$ has a horizontal tangent line @ $x = c$.

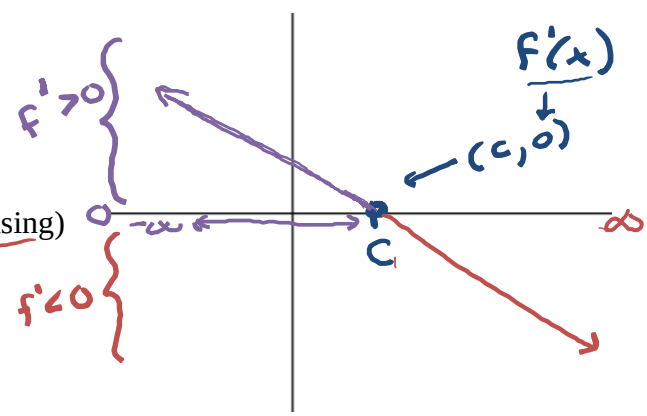


② Notice when $f'(x) > 0$
(positive slopes of tangent lines are 0, $f(x)$ is increasing)

$f'(x) > 0$ on $(-\infty, c)$ b/c $f(x)$ inc on $(-\infty, c)$

③ Notice when $f'(x) < 0$
(positive slopes of tangent lines are 0, $f(x)$ is decreasing)

$f'(x) < 0$ on (c, ∞) b/c $f(x)$ dec on (c, ∞)



$f(x) = -x^2$
$f'(x) = -2x$ ← linear w/ negative slope!