DATE: ______________

Velocity and Other Rate of Change (AP Questions)

1. A particle moves along the x-axis with its position at time t given by $x(t) = (t - a)(t - b)$, where a and b are constants and $a \neq b$. For which of the following values of t is the particle at rest?

$v(t) = 0$

(A) $t = ab$

(B) $t = \frac{a+b}{2}$

(C) $t = a + b$

(D) $t = 2(a + b)$

(E) $t = a$ and $t = b$

$x'(t) = v(t) = (t-b)(1) + (t-a)(1)$

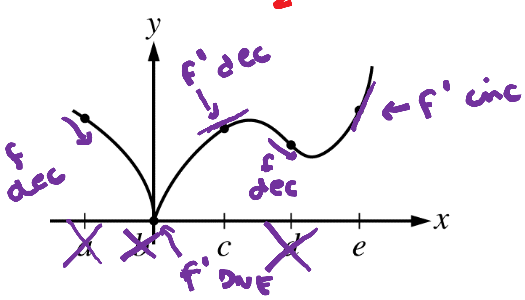
$= t - b + t - a$

$= 2t - b - a$

$0 = 2t - b - a$

$a + b = 2t$

$\frac{a+b}{2} = t$



Graph of f

2. The graph of the function f is shown in the figure above. For which of the following values of x is $f'(x)$ positive and increasing?

↳ f inc ↳ f' inc → slopes of f getting steeper

~~(A)~~ a → $f' < 0$ @ $x = a$ b/c f dec @ $x = a$

~~(B)~~ b → f' DNE @ $x = b$ b/c $\lim_{x \to b^-} f'(x) \neq \lim_{x \to b^+} f'(x)$

~~(C)~~ c → f' dec @ $x = c$ b/c slopes of f are getting less steep @ $x = c$

~~(D)~~ d → $f' < 0$ @ $x = d$ b/c f dec @ $x = d$

(E) e → P.O.E.

or

f' inc @ $x = e$ b/c slopes of f are getting steeper @ $x = e$

process of elimination