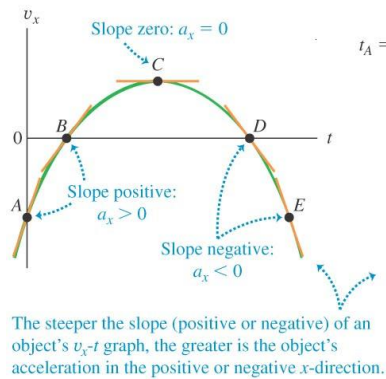
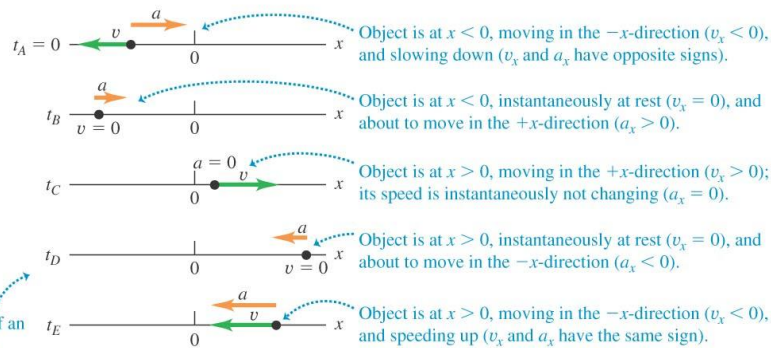


(a)  $v_x$ - $t$  graph for an object moving on the  $x$ -axis



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(b) Object's position, velocity, and acceleration on the  $x$ -axis



Recall from calculus that if:

a)  $\frac{d^2 f(x)}{dx^2} > 0$  on an open interval  $(a,b)$ , then  $f(x)$  is concave up on  $(a,b)$ .

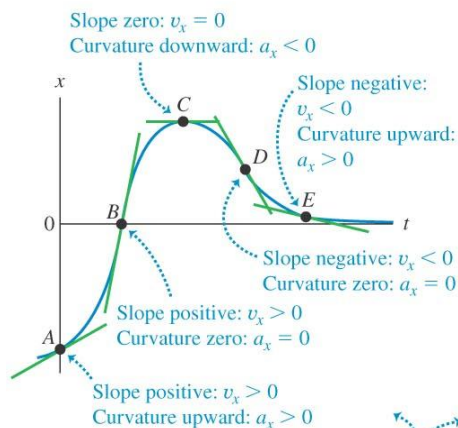
b)  $\frac{d^2 f(x)}{dx^2} < 0$  on an open interval  $(a,b)$ , then  $f(x)$  is concave down on  $(a,b)$ .

This implies that if:

a')  $a = \frac{d^2 x(t)}{dt^2} > 0$  on an open interval  $(a,b)$ , then  $x(t)$  is concave up on  $(a,b)$ .

b')  $a = \frac{d^2 x(t)}{dt^2} < 0$  on an open interval  $(a,b)$ , then  $x(t)$  is concave down on  $(a,b)$ .

(a)  $x$ - $t$  graph



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(b) Object's motion

