

2-3 Obj:

to solve Free Response questions  
involving pos  $\rightarrow$  vel  $\rightarrow$  accel.

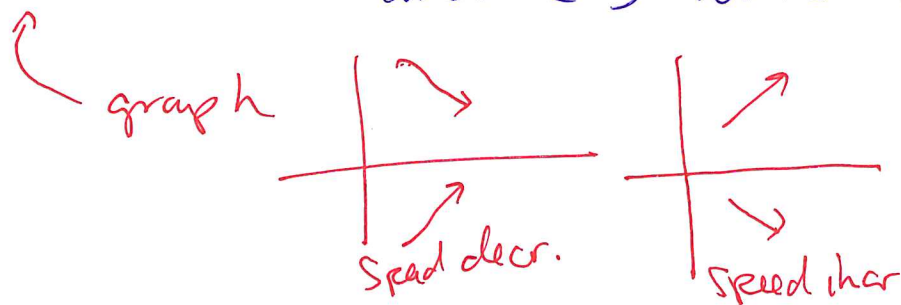
Let  $v(t) = 10 + 5 \sin t^{\circ}$  ft/min  
of a particle.

Q. Find the accel at  $t = 3$ .

$$a(3) = v'(3) = -5.46675 \text{ ft/min}^2$$

Q. Is the speed increasing or decreasing  
at  $t = 3$ ?

Speed decreasing since  $a(3) = -5.467 < 0$   
and  $v(3) = 10.412 > 0$ .



OR if  $v$  &  $a$  same signs  $\Rightarrow$  speed incr  
if  $v$  &  $a$  different signs  $\Rightarrow$  speed decr

Q. What is its position at  $t=5$   
if its position at  $t=1$  is 8 ft.

---

If want distance traveled,

then  $\int_a^b |v(t)| dt$ .

If want a position,

then FTC.

$$\int_a^b v(t) dt = f(b) - f(a)$$

Alt.  $f(b) = f(a) + \int_a^b v(t) dt$

↑                    ↑  
start            Δ in pos.

$$f(5) = f(1) + \int_1^5 v(t) dt$$

$$f(5) = 8 + 40.2176$$

$$= \boxed{48.218 \text{ ft}}$$