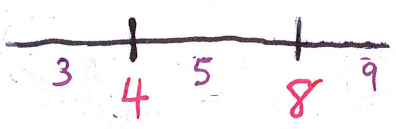
# Particle Motion Problem Steps (Motion along a line)

1) Find $v(t)$ by taking the derivative of the position function $x(t)$ (use power rule)

2) Find times when object is motionless $(v(t)=0)$. Solve for $t$. (ex: $t=4,8$)

3) Create velocity sign line $v(t)$



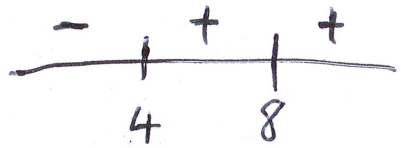

4) Pick a value in each interval to plug into $v(t)$

Ex. $v(3)=-6$ (moves left)

$v(5)=1$ (moves right)

$v(9)=3$ (moves right)

$v(t)$




5) Find when object change directions (count the number of sign changes)

object changes direction at $t=4$ b/c $v(t)$ changes signs.

6) Determine the time intervals of object moving left and right

based on above example

moving left: $(-\infty, 4)$ because $v(t)<0$

moving right: $(4,8), (8,\infty)$ because $v(t)>0$