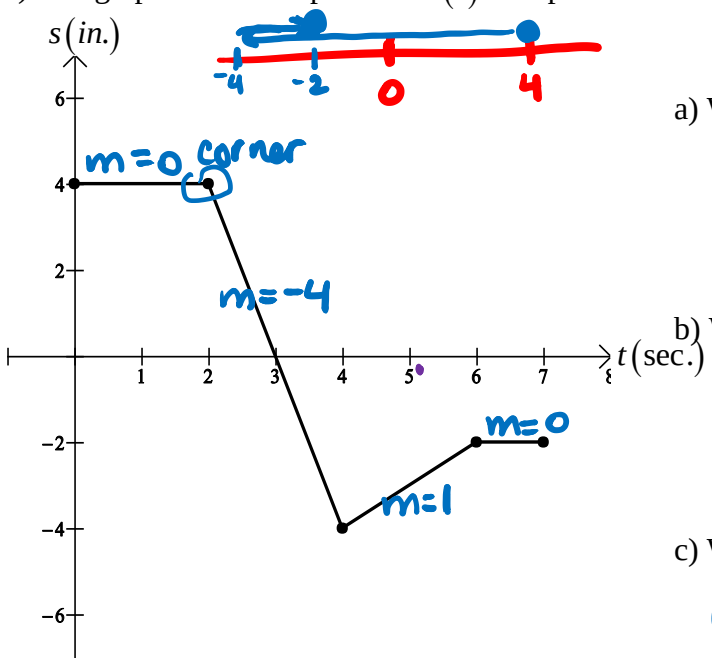
3.4 - Velocity, Speed and Acceleration

1) The graph shows the position $s(t)$ of a particle moving along a horizontal coordinate axis.



a) When is the particle moving to the left?

(2, 4)

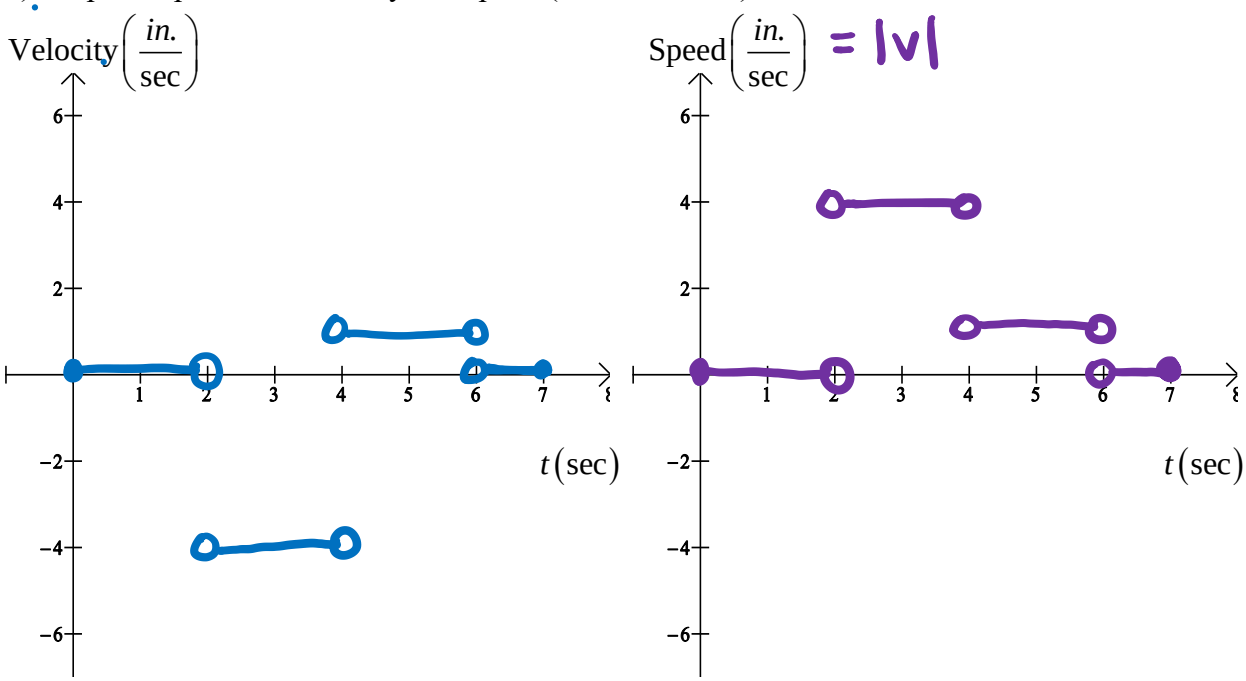
b) When is the particle moving to the right?

(4, 6)

c) When is the particle standing still?

(0, 2) ∪ (6, 7)

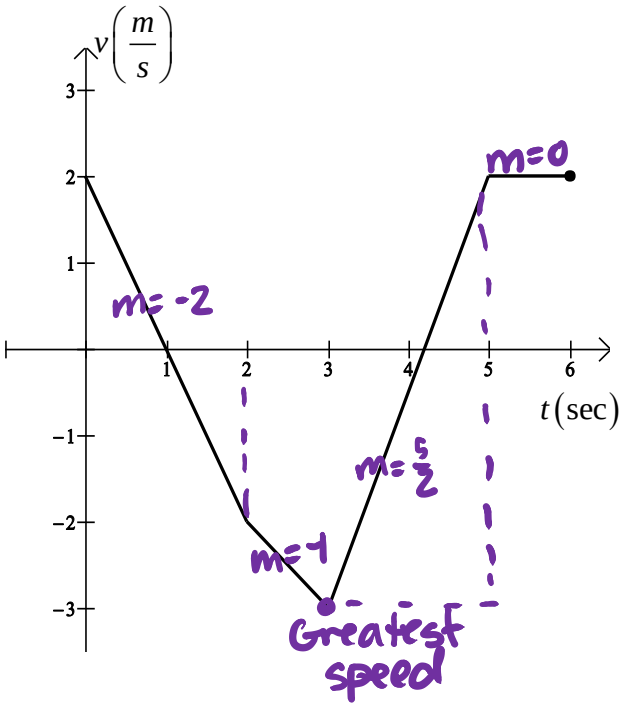
d) Graph the particle's velocity and speed (where defined)



e) When is the particle moving the fastest?

Greatest speed 2-4 sec 4 in/sec

2) The graph shows the velocity $v = f(t)$ of a particle moving along a horizontal coordinate axis.



a) When does the particle reverse direction?

t = 1, 4.2 sec

b) When is the particle moving at a constant speed?

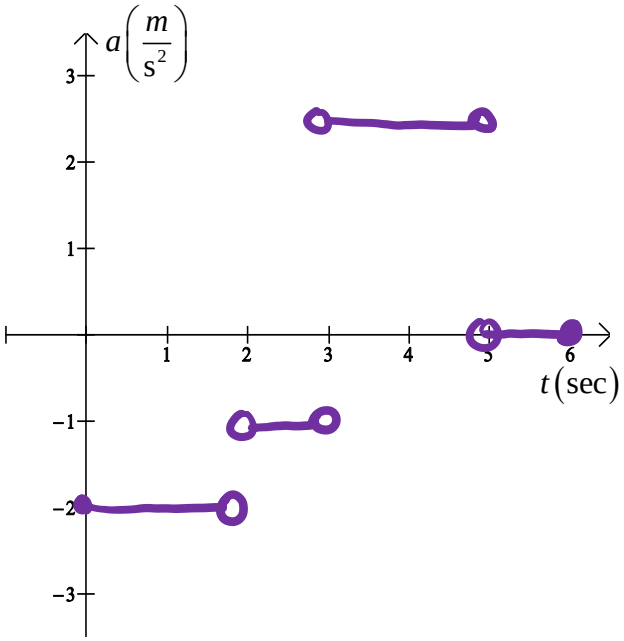
5-6 sec

c) When is the particle moving at its greatest speed?

|v| 3 sec

3 m/s

d) Graph the acceleration (where defined)



In economics, derivatives are used to find the **marginal cost**, which is the cost of each unit produced of a product. To find marginal cost, just take the derivative of the cost function! Additionally, you can find the **marginal revenue** (the amount of revenue per unit that is gained from the product's sale) by taking the derivative of the revenue function.

3. Suppose it costs $c(x) = x^3 - 6x^2 + 15x$ dollars to produce x radiators when 8 to 10 radiators are produced, and that $r(x) = x^3 - 3x^2 + 12x$ gives the dollar revenue from selling x radiators. Your shop currently produces 10 radiators a day. Find the marginal cost and marginal revenue when selling 10 radiators a day.