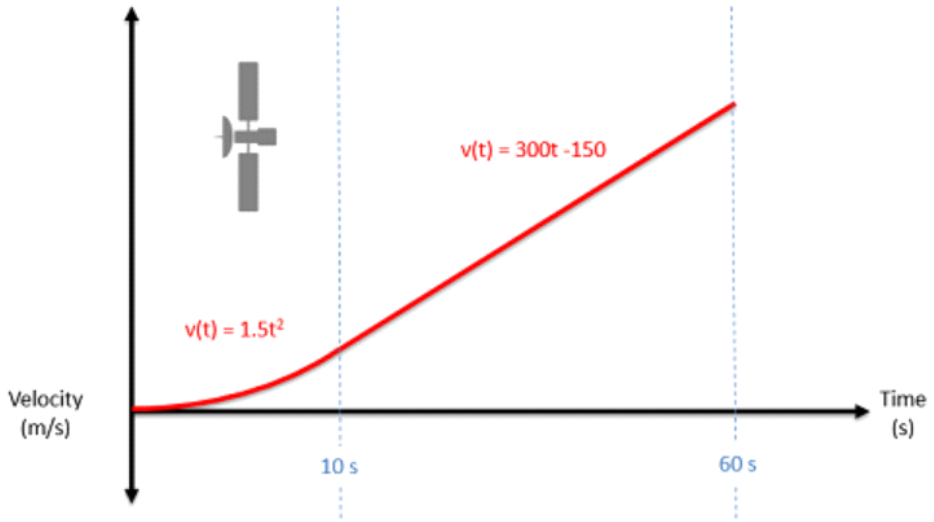
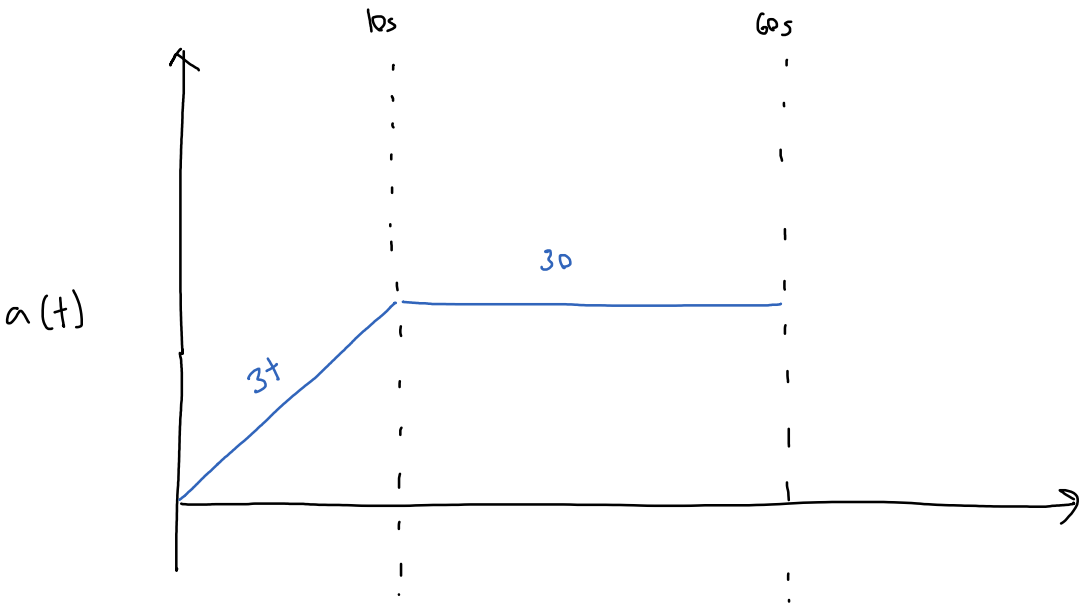
Question 3:

A satellite records the velocity function shown below over a sixty second time period. During that same time period determine the acceleration and position functions and draw these functions on a plot.



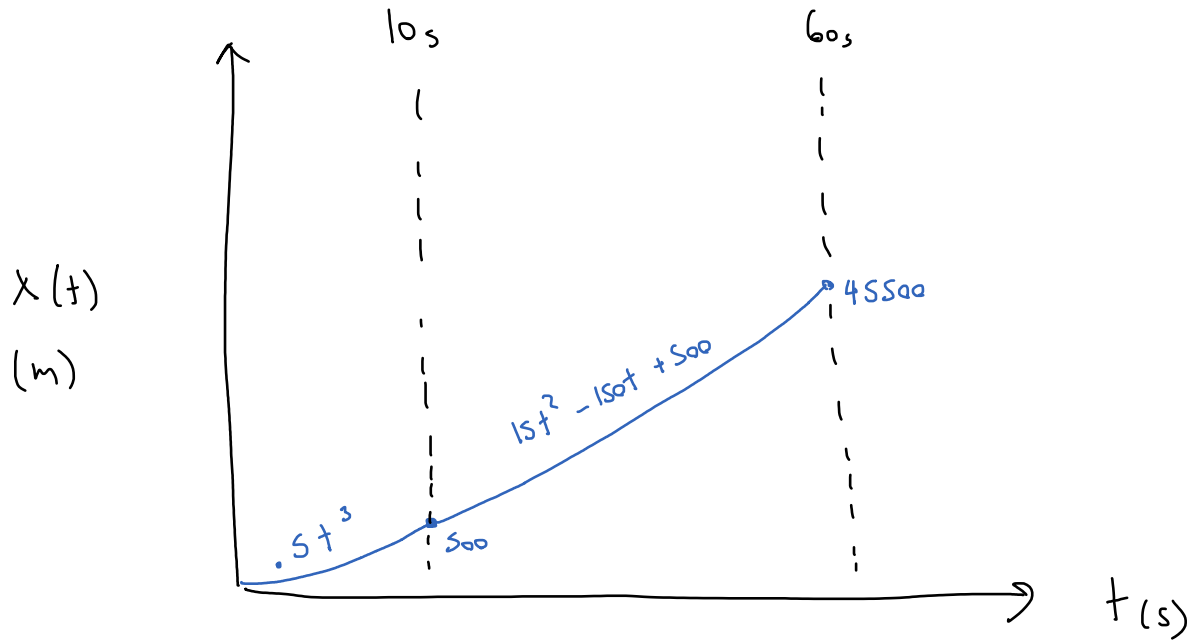


I

$$a(t) = \frac{dV}{dt} = \frac{d(1.5t^2)}{dt} = 3t$$

II

$$a(t) = \frac{dV}{dt} = \frac{d(30t - 150)}{dt} = 30$$



I

$$X(t) = \int V(t) = \int 1.5t^2$$

$$X(t) = .5t^3 + C \qquad X(0) = 0$$

$X(10) = 500$ m

II $X(t) = \int V(t) = \int 30t - 150$

when $t = 10$, $x = 500$

$$X(t) = 15t^2 - 150t + C$$

$$C = 500$$

$$X(t) = 15t^2 - 150t + 500$$