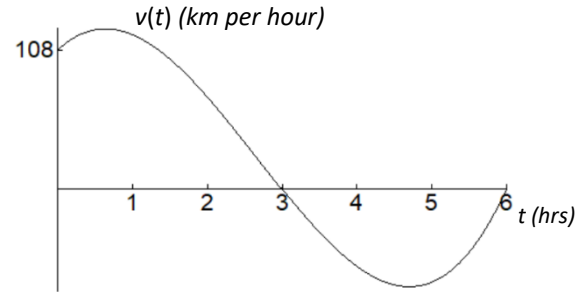


Luke Takes a Trip (Section 5.3)

The figure shows the velocity of Luke's trip from Beggar's Canyon. Positive velocities take him **away** from Beggar's Canyon and negative velocities take him **toward** Beggar's Canyon.

The formula of the velocity, in km/hr, is given by
 $v(t) = 6(t-3)(t-6)(t+1) = 6t^3 - 48t^2 + 54t + 108$,
 where t is in hours.

Recall $v(t) = s'(t)$, where $s(t)$ is his position from Beggar's Canyon.



Complete the blanks.

- a. How many km is Luke away from Beggar's Canyon at the end of the 6 hours?

At the end of 6 hours Luke is a distance of _____ km from Beggar's Canyon.

Represent this as an integral:

$$\int_{\boxed{}}^{\boxed{}} (\boxed{}) dx = \boxed{}$$

- b. When is Luke farthest from Beggar's Canyon? How far away was he at that time?

At $t = \underline{\hspace{2cm}}$ hours Luke is the maximum distance of _____ km from Beggar's Canyon.

Represent this as an integral:

$$\int_{\boxed{}}^{\boxed{}} (\boxed{}) dx = \boxed{}$$

- c. At the start of the trip, Luke had set his "trip odometer," which records km traveled, to 0 km. Report the total number of kilometers the odometer reads at the end of the trip, i.e., after 6 hours. _____ km. The following graph of Luke's speed may be helpful.

Represent this as an integral:

$$\int_{\boxed{}}^{\boxed{}} (\boxed{}) dx = \boxed{}$$

