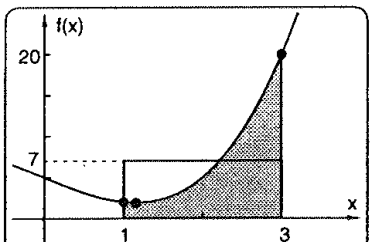
Selected Answers to Review Problems for Unit 4

p. 551 C2; Assume that the distance from New York to Los Angeles is 4000 km and the human body can withstand a maximum of 5 g. It would take about 9.5 min.

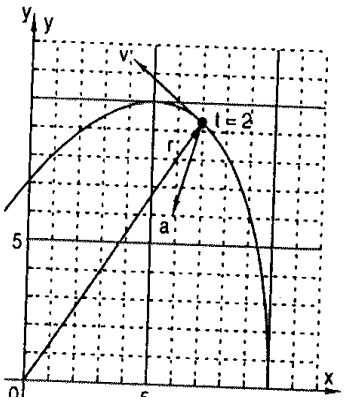
p. 552 - 3:



T2; $4663
T3; minimum: 1.9207... maximum: 20 average: 7
graph: the area of the rectangle with altitude 7 = the area under the graph.

T5; The object traveled about 2532.25 cm. the average velocity was about 120.6 cm/sec

T6; $\vec{v}(t)=(-4\sin 0.4\,t)\vec{i}+(6\cos 0.6t)\vec{j}$



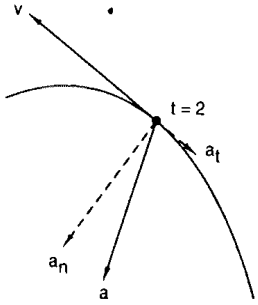
T7; $\vec{a}(t)=(-1.6\cos 0.4\,t)\vec{i}+(-3.6\sin 0.6t)\vec{j}$

T8; $\vec{r}(2)=6.967\vec{i}+9.320\vec{j}$ Graph for T8 - T10:

T9; $\vec{v}(2)=-2.869\vec{i}+2.174\vec{j}$

T10; $\vec{a}(2)=-1.115\vec{i}+-3.355\vec{j}$

T11; $\vec{a}_t(2)=.9069\vec{i}+-.6871\vec{j}$ $\vec{a}_n(2)=-2.022\vec{i}+-2.668\vec{j}$ Graph:



T12; The tangential component $\vec{a}_t(2)$ has direction the opposite of $\vec{v}(2)$, so $\vec{v}$ is decreasing and the object is slowing down at t = 2.

T13; object is slowing down. $\left|\vec{a}_t(2)\right|=1.378\text{mph/h}$

T14; $\vec{a}_n(2)$ points inward to the concave side because $\vec{a}_n$ is the component of acceleration that pulls the object out of the straight path into a curve.

T15; L ≈ 10.09 mi.

p. 595:

T1; Using exponential regression: F ≈ 29.983 $(1.0626)^x$ W ≈412.5 ft – lb. If you use a trapezoidal approximation W ≈ 413 ft – lb.