Problem Set #3

2/9/2001

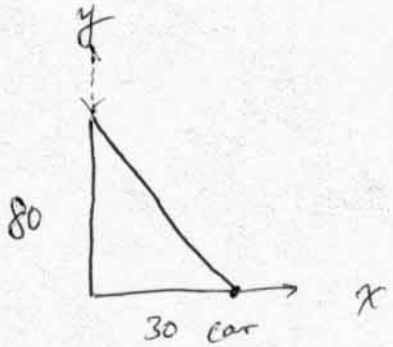
17.4

#6

start:

N

@ 7:30 am



D = distance between car and truck

$D = \sqrt{x^2+y^2}$

y = distance from truck to origin of car

x = distance car has traveled

$D^2 = x^2+y^2$

$\frac{d}{dt} D^2 = \frac{d}{dt}(x^2+y^2)$

* we want $\frac{dD}{dt}$

$2D\frac{dD}{dt} = 2x\frac{dx}{dt} + 2y\frac{dy}{dt}$

@ 7:30 am. $y = 80$ $x = 30$

$D = \sqrt{30^2+80^2} = 85.44$

$\frac{dx}{dt} = 60$ $\frac{dy}{dt} = -40$

$$\frac{dD}{dt} = \frac{(30 \cdot 60) + (80 \cdot -40)}{85.44}$$

$$\frac{dD}{dt} = -16.38 \text{ mph}$$