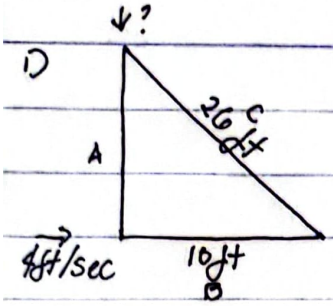
KERVIN CLYDE S. PADILLA CS 201 DIFFCALC

16/20

1)



$4 ft/sec = \frac{db}{dt}$

$A^2 + B^2 = C^2$

$A^2 + 10^2 = 26^2$

$A^2 = 576$

$A = 24$

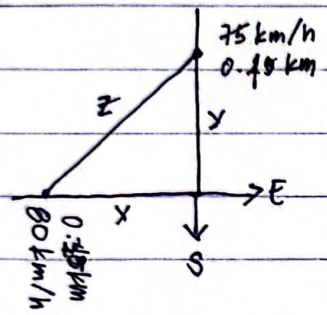
$\frac{da}{dt} = -\frac{b}{a}\frac{db}{dt}$

$= -10/24(4) = -40/24 = -5/3\ ft/s$

$\frac{da}{dt} = -5/3\ ft/s$

∴ The beam is pulling at a rate of 5/3 ft/s

2)



$x^2 + y^2 = z^2$

$0.40^2 + 0.25^2 = z^2$

$z^2 = 0.2225$

$z = 0.471699054\ 6$ or $\sqrt{0.225}$

$\frac{dx}{dt} = -80\ km/h$ $\frac{dy}{dt} = -75\ km/h$

$\frac{dz}{dt} = \frac{1}{z}\left(x\frac{dx}{dt} + y\frac{dy}{dt}\right)$

$\frac{1}{0.472}(0.25(-80) + 0.40(-75))$

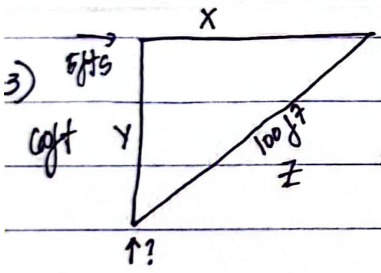
or

$\frac{1}{\sqrt{0.2225}}(0.25(-80) + 0.40(-75)) = -105.999788$

$dz/dt = -105.9998\ km/h$

∴ The cars are approaching each other at a rate of 105.9998 km/h

3)



$\frac{dy}{dt} = 5\ ft/s$

$x^2 + y^2 = z^2$

$x^2 + 60^2 = 100^2$

$x^2 = 6400$

$x = 80$

$\frac{80}{60}(5) = 400/60 = 6.67\ ft/s$

$\frac{dz}{dt} = 6.67\ ft/s$

∴ The kite is rising at 6.67 ft/s