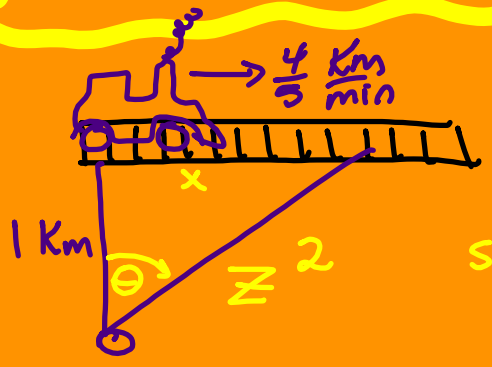
Related Rates 3

8/



$\sec\theta = \frac{hyp}{adj}$

$\frac{d}{dt}\left[\tan\theta = \frac{x}{1}\right]$

$\sec\frac{\pi}{3}\quad \sec^2\theta \frac{d\theta}{dt} = \frac{dx}{dt}$

$(2)^2 \frac{d\theta}{dt} = \frac{4}{5}$

$\frac{1}{4}\cdot 4\ \frac{d\theta}{dt} = \frac{4}{5}\cdot\frac{1}{4}$

$\frac{d\theta}{dt} = \frac{1}{5}\ \frac{rad}{min}$

9.

$3 \frac{in^3}{sec}$

$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3}\pi \left(\frac{h}{4}\right)^2 h$

$V = \frac{1}{3}\pi \frac{h^2}{16} \cdot h$

$V = \frac{1}{48}\pi h^3$

$\frac{dV}{dt} = \frac{1}{16}\pi h^2 \frac{dh}{dt}$

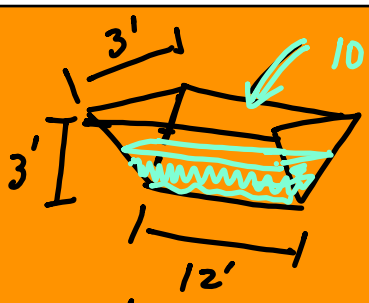
$-3 = \frac{\pi}{16}(5)^2 \frac{dh}{dt}$

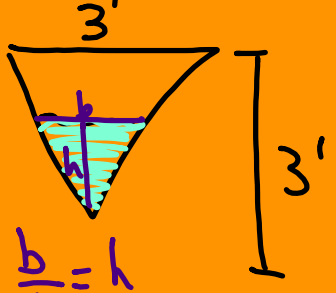
$\frac{16}{25\pi} \quad -3 \frac{in^3}{sec} = \frac{25}{16}\pi \frac{in^2}{} \frac{dh}{dt}$

$2 \cdot \frac{r}{2} = \frac{h}{8} \cdot 2$

$r = \frac{h}{4}$

$\frac{-48}{25\pi} \frac{in}{s} = \frac{dh}{dt}$





$\frac{b}{3} = \frac{h}{3}$

$3b = 3h$

$b = h$

$V = \frac{1}{2} bhl$

$V = \frac{1}{2} b \cdot h \cdot (12)$

$V = 6bh$

$V = 6 \cdot h \cdot h$

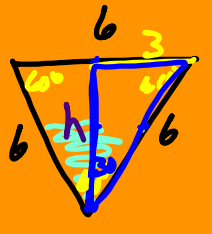
$V = 6h^2$

$\frac{dV}{dt} = 12h \frac{dh}{dt}$

$10 = 12(2) \frac{dh}{dt}$

$\frac{10}{24} = 24 \frac{dh}{dt}$

$\frac{5}{12} \frac{ft}{min} = \frac{dh}{dt}$



$h = 3\sqrt{3}$