

$$6^2 + x^2 = s^2$$

$$0 + 2x \frac{dx}{dt} = 2s \frac{ds}{dt}$$

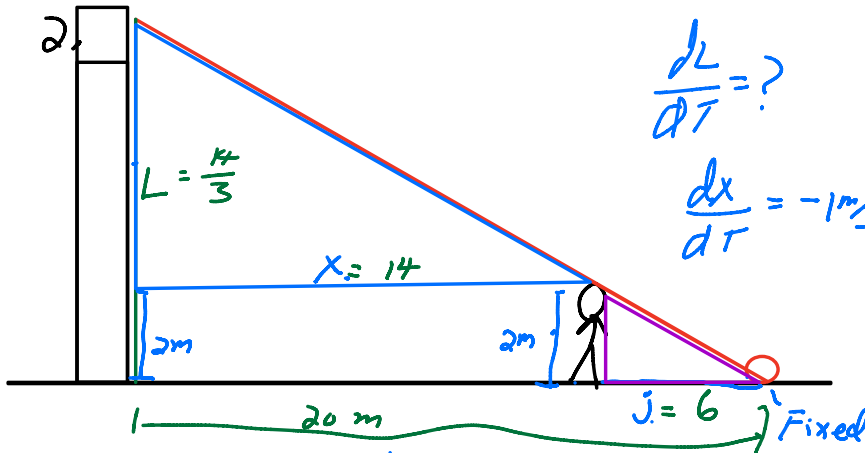
$$\frac{ds}{dt} = -400$$

$$\Rightarrow 2 \cdot 8 \cdot \frac{dx}{dt} = 2 \cdot 10 (-400)$$

$$s = 10 \quad x = ?$$

$$6^2 + x^2 = 10^2$$

$$x = 8$$



$$\frac{dL}{dt} = ?$$

$$\frac{dx}{dt} = -1 \text{ m/s}$$

$$\frac{dj}{dt} = 1 \text{ m/s}$$

$$\frac{L}{x} = \frac{2}{j}$$

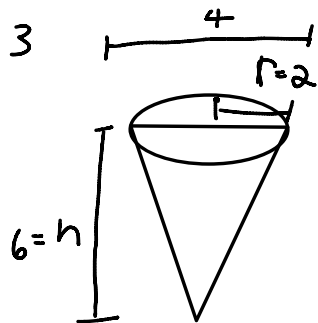
$$2x = Lj$$

$$2 \frac{dx}{dt} = \frac{dL}{dt} \cdot j + L \cdot \frac{dj}{dt}$$

$$\frac{L}{14} = \frac{2}{6}$$

$$\frac{28}{6} = \frac{L}{6}$$

$$\frac{14 \cdot 2}{3 \cdot 2} = L$$



$$\frac{r}{n} = \frac{2}{6} \Rightarrow 6r = 2h$$

$$3r = h$$

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

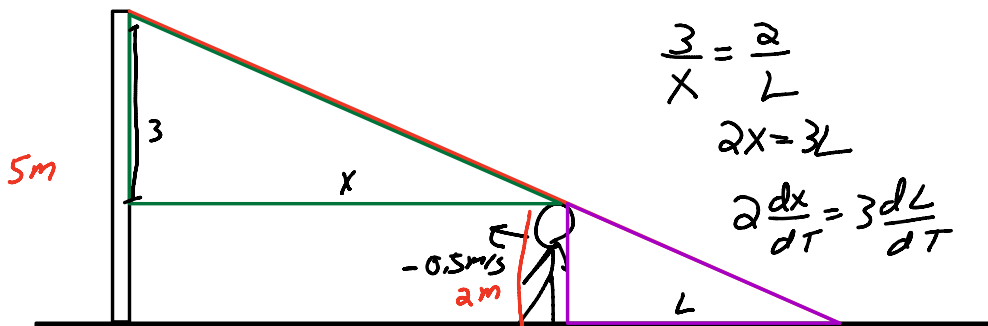
$$\frac{dV}{dT} = -2 \text{ cm}^3/\text{sec}$$

$$? = \frac{dh}{dT} \text{ when } h = 3$$

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

$$V = \frac{1}{3} \pi \left(\frac{h}{3}\right)^2 h = \frac{\pi}{27} h^3$$

4



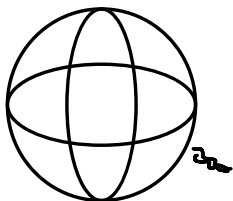
$$\frac{3}{x} = \frac{2}{L}$$

$$2x = 3L$$

$$2 \frac{dx}{dT} = 3 \frac{dL}{dT}$$

Find $\frac{dL}{dT}$ when $x = 3 \Rightarrow L = 2$

5.



$$\frac{dV}{dT} = 2 \text{ cm}^3/\text{min}$$

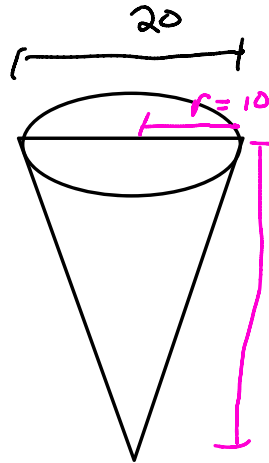
$$V = \frac{4}{3} \pi r^3$$

$$\frac{dV}{dT} = 4\pi r^2 \frac{dr}{dT} \Rightarrow \text{Find } \frac{dr}{dT}$$

$$SA = 4\pi r^2$$

$$\frac{dSA}{dT} = 8\pi r \frac{dr}{dT}$$

6.



$$\frac{r}{10} = \frac{h}{30}$$

$$30r = 10h$$

$$3r = h \Rightarrow r = \frac{h}{3}$$

$$\frac{dv}{dt} = -12 \text{ cm}^3/\text{sec}$$

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

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

$$V = \frac{1}{3}\pi \cdot \frac{h^2}{9} \cdot h = \frac{1}{27}\pi h^3$$

$$\frac{dh}{dt} = ? \text{ when } h = 20$$

7.

$$\frac{C}{2\pi} = r$$

$$C = 2\pi r \Rightarrow \left| = 2\pi \frac{dr}{dc} \right.$$

$$A = \pi r^2$$

$$\frac{dA}{dc} = \pi \cdot 2r \cdot \frac{dr}{dc}$$

~~$$\left| = 2\pi \frac{dr}{dc} \right.$$~~

~~$$\frac{1}{2\pi} = \frac{dr}{dc}$$~~

$$\frac{dr}{dt} = -3 \text{ m/s}$$

$$\frac{dx}{dt} = ? \text{ when } x = 8$$

what is r = ?



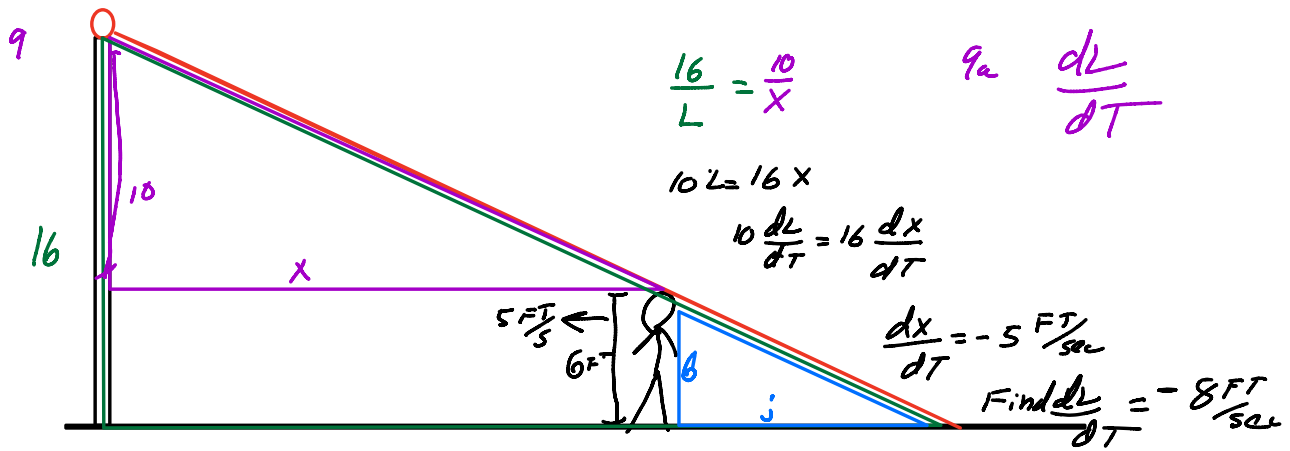
$$6^2 + x^2 = r^2$$

$$6^2 + 8^2 = r^2$$

$$10 = r$$

$$36 + x^2 = r^2$$

$$0 + 2x \frac{dx}{dt} = 2r \frac{dr}{dt}$$



L

$\frac{10}{X} = \frac{6}{j}$ $\frac{dX}{dT} = -5 \text{ FT/sec}$ Find $\frac{dj}{dT} = ?$

