

Warmup

factor } $15x^{1/4} - \frac{1}{2}x^{-3/4}$

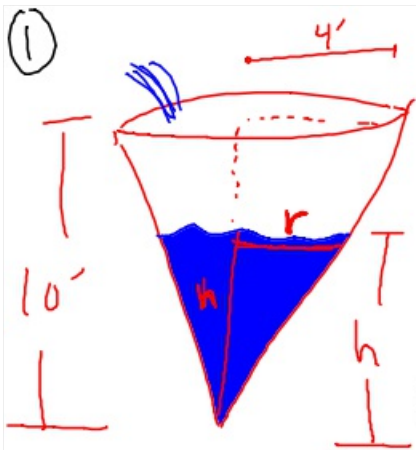
$$x^{-3/4} \left(15x^1 - \frac{1}{2} \right)$$

multiply
top & bottom
by
denom.

$$\frac{2 \left(15x - \frac{1}{2} \right)}{2 \left(x^{3/4} \right)} = \frac{30x - 1}{2x^{3/4}}$$

ex

$$3x^5 - 2x^3$$



② $\frac{dh}{dt} = ? \frac{\text{ft}}{\text{min}}$

③ $10'$ → cone height ② $\frac{\text{ft}^3}{\text{min}} = \frac{dV}{dt}$
 $4'$ → cone radius

④ $V = \frac{1}{3} \pi r^2 h$

⑥ $V = \frac{\pi}{3} \left(\frac{2}{5}h\right)^2 h$

$V = \frac{\pi}{3} \cdot \frac{4}{25} h^2 \cdot h$

$\frac{dV}{dt} = \frac{d}{dt} \left(\frac{4\pi}{75} h^3 \right)$

⑤ $\frac{h}{4} = \frac{h}{r}$
 $10r = 4h$
 $r = \frac{2}{5}h$

$\frac{dV}{dt} = \frac{4\pi}{75} \cdot 3h^2 \cdot \frac{dh}{dt}$

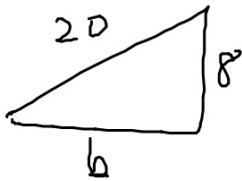
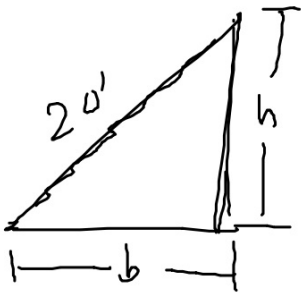
7) ↑ ↑ ↑
 2 5 ?

⑧ "

⑨ $2 = \frac{4\pi}{75} \cdot 3 \cdot 25 \cdot \frac{dh}{dt}$

$2 = \frac{12\pi}{3} \cdot \frac{dh}{dt}$
 $\frac{2}{4\pi} = \frac{4\pi}{4\pi} \cdot \frac{dh}{dt}$

$\frac{1}{2\pi} = \frac{dh}{dt}$
 ft/min



$$20^2 = b^2 + 8^2$$

$$\underline{\underline{\sqrt{336} = b}}$$

$$\frac{dh}{dt} = ? \quad \frac{db}{dt} = 4 \quad @ \quad \underline{h = 8}$$

$$b^2 + h^2 = 20^2$$

$$2b \frac{db}{dt} + 2h \frac{dh}{dt} = 0$$

$$2(\sqrt{336})4 + 2 \cdot 8 \frac{dh}{dt} = 0$$

$$\frac{dh}{dt} = \frac{-\sqrt{336}}{2}$$

$$\boxed{\frac{dh}{dt} \approx -9.1 \text{ ft/sec}}$$

548, 549
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