

MATH 112 SOLUTIONS FOR 3.6, P. 279

2.  $-6\pi \text{ cm}^2/\text{sec}$ .
4.  $1.8\pi \text{ in}^3/\text{sec}$ .
5.  $\frac{dh}{dt} = \frac{2.4}{\pi} \text{ ft}/\text{min}$ .
7.  $150,000 \text{ ft}/\text{hr}$
9.  $-\frac{1}{\sqrt{2}} \text{ ft}/\text{sec}$ .
10.  $-9 \text{ m}/\text{sec}$ .
13.  $\frac{100\pi}{3} \text{ m}/\text{hr}$ .
14.  $\frac{dP}{dt} = 0.051k$ .
17.  $\frac{1}{2} / \text{year}$ .
19. We are told  $\frac{dV}{dt} = -kS$ . From  $V = \frac{4}{3}\pi r^3$ , we get  $\frac{dV}{dt} = 4\pi r^2 \frac{dr}{dt}$ . But  $S = 4\pi r^2$ , so  $4\pi r^2 \frac{dr}{dt} = -k(4\pi r^2) \Rightarrow \frac{dr}{dt} = -k$ .