Calculus Section 2.6
13, 14, 16-21

14. $A = \pi r^2$

$\frac{dA}{dt} = 2\pi r \frac{dr}{dt}$

$\frac{dA}{dt}$ is not constant, it depends on r.

This is because the Area increases with the square of the radius.

16. a) Sphere $\frac{dr}{dt} = 2 \frac{in}{min}$

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

Find $\frac{dV}{dt}$ when $r = 6$, $r = 24$

$\frac{dV}{dt} = 4\pi r^2 \frac{dr}{dt}$

$\frac{dV}{dt} = 4(\pi)(6in)^2\left(2\frac{in}{min}\right) = 288\pi \frac{in^3}{min}$

$4\pi(24in)^2\left(\frac{2in}{min}\right) = 4608\pi \frac{in}{min}$

b) The volume increase with the cube of the radius. $\frac{dV}{dt}$ depends on the r^2 and $\frac{dr}{dt}$