5. $V = \frac{1}{3}\pi r^2 h$ $\quad \frac{dV}{dt} = ?$ $\quad \frac{dr}{dt} = 4$, $h = 6r$

$V = \frac{1}{3}\pi r^2 (6r)$

$V = 2\pi r^3$

$\frac{d}{dt}(V) = \frac{d}{dt}(2\pi r^3)$

$\frac{dV}{dt} = 2\pi \cdot 3r^2 \cdot \frac{dr}{dt}$

$= 6\pi r^2 \cdot 4$

$\frac{dV}{dt} = 24\pi r^2$

$r = 3$

$\frac{dV}{dt} = 24\pi (3)^2$

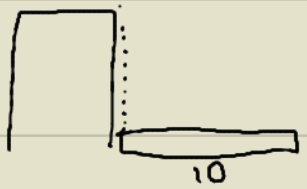
$= 216\pi$

$r = 12$

$\frac{dV}{dt} = 24\pi (12)^2$

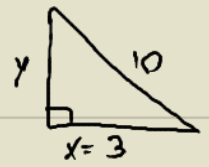
$= 3456\pi$

6.



$\frac{dy}{dt} = 0.25$

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



$x^2 + y^2 = 10^2$

$\frac{d}{dt}(x^2) + \frac{d}{dt}(y^2) = \frac{d}{dt}(100)$

$2x \cdot \frac{dx}{dt} + 2y \cdot \frac{dy}{dt} = 0$

$x \frac{dx}{dt} + y \frac{dy}{dt} = 0$

$3 \cdot \frac{dx}{dt} + \sqrt{91}(0.25) = 0$

$3 \cdot \frac{dx}{dt} = -\sqrt{91}(0.25)$

$\frac{dx}{dt} = \frac{-\sqrt{91}(0.25)}{3}$

$= \frac{-\sqrt{91}\left(\frac{1}{4}\right)}{3}$

$= \frac{-\sqrt{91}}{12}$

≈ -0.79

$x^2 + y^2 = r^2$

$3^2 + y^2 = 10^2$

$9 + y^2 = 100$

$y^2 = 100 - 9$

$y^2 = 91$

$y = \sqrt{91}$