

2.  $M=85 \text{ kg}$   $h=1300 \text{ m}$   $C=.888$   $\rho_{\text{air}}=1.18 \text{ kg/m}^3$

$r=.22$

		Kinetic $\frac{1}{2}mv^2$	grav $mgh$	
velocity if no drag	top	0	$(85)(9.8)(1300)$	1082900
<u>don't need</u>	bottom	$\frac{1}{2}(85)v^2$	0	$42.5v^2$

~~$\frac{1}{2}C_p A v^2 = mg$~~   $(A=.1521)$

$\uparrow F_{\text{drag}}$   
 $\downarrow w$

$$\frac{1}{2}(.888)(1.18)\pi(.22)^2 v^2 = (85)(9.8)$$

$$v = \sqrt{\frac{2(85)(9.8)}{(.888)(1.18)\pi(.22)^2}} = \underline{\underline{102.2 \text{ m/s}}}$$

energy no drag 1082900 Joules

energy w drag  $\frac{1}{2}mv^2 = \frac{1}{2}(85)(102.2)^2 = 443906$

diff = 638994 Joules ← thermal energy produced