6. $V = k(R-r)r^2 = (kR-kr)r^2 = kRr^2 - kr^3$

MAXIMIZE V

$$\frac{dV}{dr} = 2kRr - 3kr^2$$

$$2kRr - 3kr^2 = 0$$

$$\frac{2kRr}{k} - \frac{3kr^2}{k} = \frac{0}{k}$$

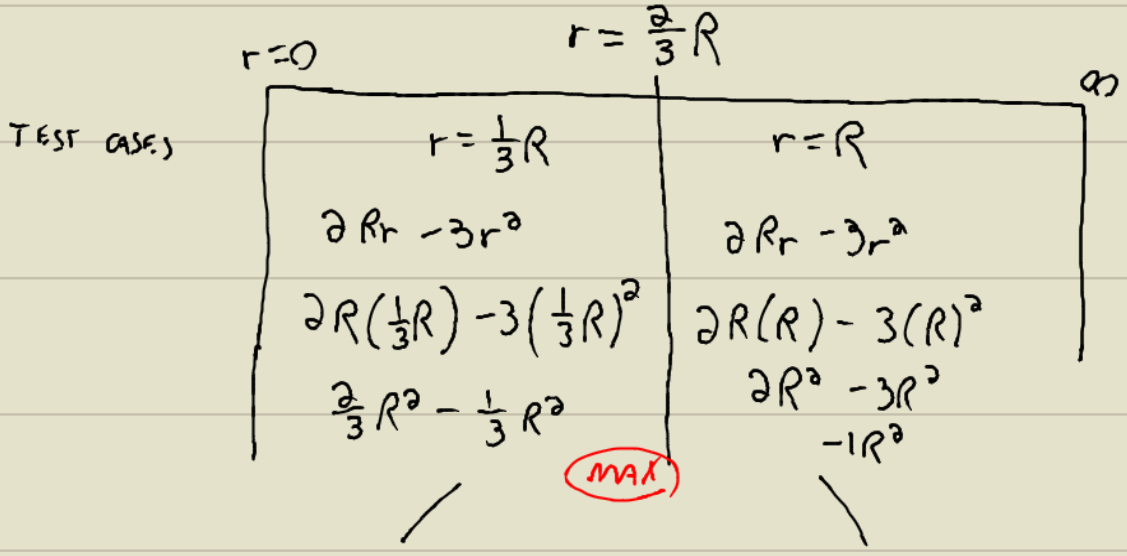
$$2Rr - 3r^2 = 0$$

$$r(2R - 3r) = 0$$

~~$r = 0$~~ $\quad 2R - 3r = 0$

$$2R = 3r$$

$$\frac{2}{3}R = r$$



MAX occurs AT $r = \frac{2}{3}R$