

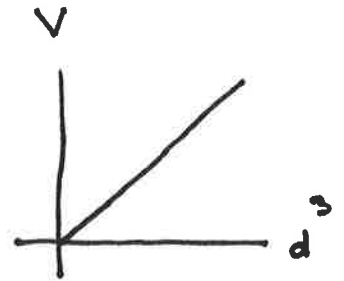
ASG v2 Ex 1.1 (Scaling of a sphere)



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

$$d = 2r$$

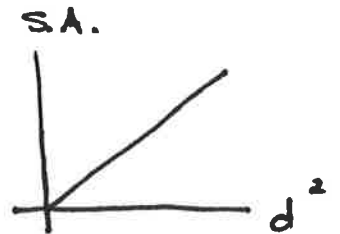
$$\Rightarrow V \propto d^3$$



If the diameter is tripled, the volume increases by a factor of $3 \cdot 3 \cdot 3 = 27$

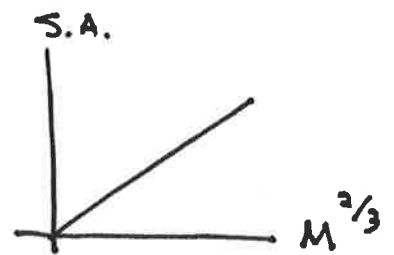
$$b) S.A. = 4\pi r^2 \Rightarrow S.A. \propto d^2$$

If $d \rightarrow 3d$ then $S.A. \rightarrow 9 S.A.$



$$c) \text{ Since } M \propto V \text{ and } V \propto d^3 \\ M \propto d^3 \text{ or } d \propto M^{1/3}$$

$$\text{Since } S.A. \propto d^2 \quad S.A. \propto M^{2/3}$$



$$\text{If } M \rightarrow 3M$$

$$S.A. \rightarrow 3^{2/3} S.A.$$

$$\text{or } S.A. \rightarrow 2.08 S.A.$$