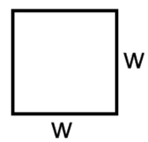
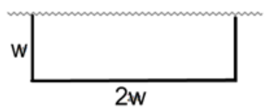
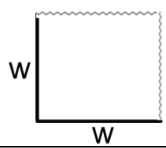
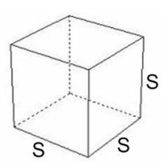
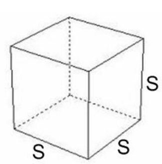
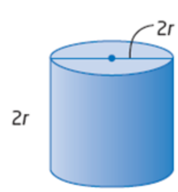
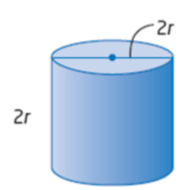
Date: ________________________________ Name: _________________________________

Chapter 9 Optimization Review

	Desired Shape	What you are given	The following equations will be useful:
Maximizing a rectangular **area** given its perimeter	With 4 sides of fencing 	Perimeter	**$P = 4w$** **$A = l \times w$ or $A = w^2$**
	With 3 sides of Fencing 	Perimeter	**$P = 4w$** **$A = l \times w$ or $A = 2w^2$**
	With 2 sides of fencing 	Perimeter	**$P = 2w$** **$A = l \times w$ or $A = w^2$**
Minimizing the **surface area** of a square-based prism		Volume	**$V = s^3$**
Maximizing the **volume** of a square-based prism		Surface Area	**$SA = 6s^2$**
Maximizing the **volume** of a cylinder	h = d or h = 2r 	Surface Area	Substituting h = 2r into $SA = 2\pi r^2 + 2\pi rh$, we get $SA = 2\pi r^2 + 2\pi r(2r)$ $SA = 2\pi r^2 + 4\pi r^2$ **$SA = 6\pi r^2$**
Minimizing the **surface area** of a cylinder	h = d or h = 2r 	Volume	Substituting $h = 2r$ into $V = \pi r^2 h$, *we get* $V = \pi r^2 (2r)$ **$V = 2\pi r^3$**