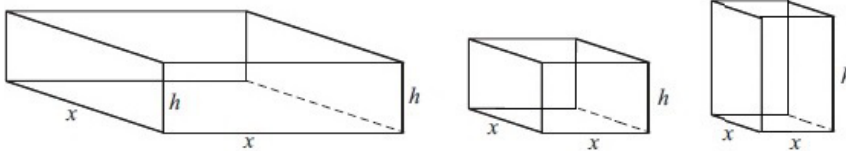Rhino Bonus (+2) Due at the start of class Thursday, March 28.

1. Assume n represents a positive integer. Find the following nth derivative $\dfrac{d^n}{dx^n} e^{nx}$. Show work.

2. A rectangular tank with a square base, an open top, and any volume of V cm^3 is to be constructed of sheet steel. Shown are some possible variations. V represents some fixed constant.

a. Express the surface area S of the box as a function involving x and V, where V is a fixed constant.
b. Use calculus to show that the value of x and h for which the box has **minimum surface area** $S(x)$ will always have a height h that is half the length of the base x, i.e. the value x which solves $S'(x) = 0$ and the value h for which $x^2 h = V$ has the property that $h = \frac{1}{2} x$.