1. Use Lagrange multipliers to find the maximum and minimum values of f subject to the given constraint(s).

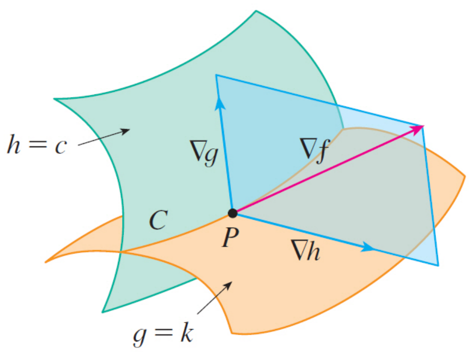
a) $f(x, y, z) = x^4 + y^4 + z^4$; $x^2 + y^2 + z^2 = 1$

A. Max : 1, Min : $\frac{1}{3}$.

b) $f(x, y, z) = 8x - 4z$; $x^2 + 10y^2 + z^2 = 5$

A. Max : 20, Min : -20.

c) $f(x, y, z) = x^2 + 2y^2 + 3z^2$; $x + y + z = 1$, $x - y + 2z = 2$



A. f has no maximum since f can attain sufficiently large values. f attains its minimum $\frac{33}{23}$ at $\frac{1}{23}(18, -6, 11)$.

2. Evaluate the double integral by first identifying it as a the volume of a solid.

$$\iint_R (5 - x)dA, \qquad R = \{(x, y) : 0 \leq x \leq 5, 0 \leq y \leq 3\}$$

A. $\frac{75}{2}$

Course Homework due Apr 2, Wed.

Mar 17, Mon. : **15.5** 1, 3, 5, 7, 9, 11, 15. **15.6** 3, 5, 7, 9
Mar 19, Wed. : **15.7** 3, 5, 7, 9, 11, 17, 21, 33
Mar 21, Fri. : **15.8** 5, 6, 7, 17, 19, 21, 23, 27