Integration problems

1.

a) $dx^n/dx = nx^{n-1}$

b) Use the multiplier rule

c) Use the sums rule too.

d) $dx^3/dx = 3x^2$, use change of variable to simplify.

e) Expand and integrate term by term.

f) $(x^2)' = 2x$, use change of variable.

g) $(x^3)' = 3x^2$, use change of variable.

A couple of problems related to differentiation.

2. Differentiate the formula for the volume of a cone

3. Differentiate the formula for the volume of a ball

to figure out how fast the radius is growing, then differentiate the formula for the surface are of a ball to finish the problem.

More integration problems.

4. There is an arbitrary constant in every indefinite integral.

5. c) By chain rule $(y'^2)' = 2y'y''$

6. a) Change of variable. b) Integrate 2 times and figure out the constants of integration.