1) A circular cylinder is being flattened so that its volume does not change. Find the rate of change of the radius when r = 2 inches and h = 3 inches, if the height is decreasing at 0.1 in/sec.

Hint: First find a relation between the volume, the radius and the hight of this cylinder. ($V = \pi r^2 h$). Then differentiate both side of the equation with respect to time. Here, V,r,h are independent functions. Please note that by assumption the volume does not change!

2) If g(x) is the inverse of the function $f(x) = 2x + \sin(x)$. Find the value of $g'(2\pi)$

Hint: Differentiate both side of this equation with respect to t and consider x and y independent functions of t.

3) Find the derivative of the function $y = x^{\tan(x)}$

Hint: Apply ln function to both side of this equation. Use one of the properties of ln function in order to simplify the right hand side of this equation. Then, treat y as a function of x and differentiate both side of this equation.