Math 101 Tutorial Worksheet 1

There is an associated quiz due on BrightSpace on Tuesday, January 18 at 10:00 PM

1. For each of the following integrals, identify possible techniques that could be used to solve them. Complete integration, showing every step along the way.

   (a) $\displaystyle\int_1^3 \frac{y-3}{\sqrt{y^2-6y+10}}dy$

   (b) $\displaystyle\int \frac{3^{\sqrt{2x}}}{\sqrt{2x}}dx$

   (c) $\displaystyle\int_{-1}^{2} \sqrt{x^2-6x+9}dx$

   (d) $\displaystyle\int \frac{\log_2 t}{t}dt$

   (e) $\displaystyle\int_{-2}^{1} \frac{2r^3+7r^2+8r+28}{r^2+4}dr$

2. Find the derivative of the function:

   (a) $F(x) = \displaystyle\int_0^x e^{t^2}dt$

   (b) $G(x) = \displaystyle\int_{2x}^{3x+1} \sin\left(t^4\right)dt.$

   Hint: Do not try to integrate either of two integrals. Instead, recall that Fundamental theorem of Calculus has two parts. One part is always loved and used by all, and the other part is needed here.