Section 6.1 - Substitution Rule and Areas Between Curves

1. For the following integrals, evaluate by using the substiution rule.

   (a) $\int \frac{e^t - e^{-t}}{e^t + e^{-t}} dt$

   (b) $\int (x+1)\sqrt{3x+2}\, dx$

   (c) $\int_0^{\pi/2} \sin^2(\theta)\cos(\theta) d\theta$

(d) $\int_0^4 \frac{p}{\sqrt{9+p^2}} dp$

(e) $\int \sec(4y)\tan(4y) dy$

2. For the following problems, sketch the region and find its area.

   (a) The region bounded by $y = e^x$, $y = e^{-2x}$ and $x = \ln(4)$.

   (b) The region bounded by $y = 8 - 2x$, $y = x + 8$, and $y = 0$.

(c) The region bounded by $y = 4 - x^2$ and $y - x - 2 = 0$.