SECTION 3.3: TRIGONOMETRIC SUBSTITUTION (DAY 1)

1. Compare the following three integrals:

   (a) $\int x\sqrt{9-x^2}\,dx$

   (b) $\int \frac{dx}{\sqrt{9-x^2}}$

   (c) $\int \sqrt{9-x^2}\,dx$

2. Summary: If $\sqrt{a^2-x^2}$ appears in an integrand (**and** other techniques do not work), then

3. Evaluate $\int \frac{dx}{x^2\sqrt{4-x^2}}$

4. Compare the following integrals:

   (a) $\int x\sqrt{9+x^2}\,dx$

   (b) $\int \frac{dx}{9+x^2}$

   (c) $\int \frac{dx}{\sqrt{9+x^2}}$

   (d) $\int \frac{dx}{\sqrt{x^2-9}}\,dx$

5. Summary:

   - If $\sqrt{a^2+x^2}$ appears in an integrand (**and** other techniques do not work), then

   - If $\sqrt{x^2-a^2}$ appears in an integrand (**and** other techniques do not work), then

6. Evaluate

   (a) $\int \frac{dx}{(4+x^2)^2}$

   (b) $\int \frac{dx}{(x^2-9)^{3/2}}$