PRACTICE

1. Determine The following indefinite integrals:

   (a) $\int \frac{e^{\tan\theta}}{\cos^2(\theta)} d\theta$

   (b) $\int \frac{e^x}{1+e^{2x}} dx$

   (c) $\int \cos^3(\theta)\sin^2(\theta) d\theta$

2. For the following curves determine the tangent line for the curve at a given point:

   (a) $x^2y^2 = 3x - 2y^3$ at $(1, 1)$

   (b) $y^4 = e^{x^2-y^2}$ at $(-1, 1)$

3. Compute: $\lim_{x \to \infty} x^3 \tan^{-1}(\frac{1}{x^2})$

4. Mr. Merrick and Dr. Vince are standing in the same location. Mr. Merrick begins walking north at 5 km/h and Dr. Vince begins walking west at 4 km/h. How quickly are they moving apart at time $t = 2$ hours?

5. Mr. Merrick is standing 3km west of Dr. Vince. Dr. Vince begins walking north at 5 km/h and Mr. Merrick begins walking West at 4 km/h. How quickly are they moving apart at time $t = 3$ hours?