

1. Find the exact equation of the line tangent to the curve $y = \sinh(1 - x^2)$ at the point $(1, 0)$.

2. Find the derivative of $y = \ln(x^2 + 4) + x \tan^{-1}(2x)$.

3. $\int \frac{1+x}{2+x^2} dx$

4. $\int \sin^5 x \cos^2 x dx$

5. $\int \frac{1}{x^2 \sqrt{x^2 - 4}} dx$ using $\tan^2 \theta + 1 = \sec^2 \theta$.

6. $\int \frac{x^3}{x^2 - 4x + 4} dx$

7. $\int \frac{1}{x[1 + (\ln x)^2]} dx$

8. $\int \frac{\sin x}{\cos x \ln(\cos x)} dx$

9. $\int \frac{1+x}{\sqrt{x-1}} dx$

10. Using L'Hôpital's Rule evaluate the following:

(4pts) a) $\lim_{x \rightarrow 0} \frac{1 - \cos x}{x + x^2}$

(6pts) b) $\lim_{x \rightarrow \infty} \sqrt[x]{x}$ hint $\sqrt[x]{x} = x^{1/x}$