

Calculus Chapter 5 Part A (Sections 1 through 5) Review

1. Expand completely: $\ln\left(\frac{3x^2}{7y}\right)$

2. Find the derivative: $y = \ln\left(\frac{\sqrt{x}}{5-x}\right)$.

Note: Do not worry about getting into one fraction, just solve for y' and leave it.

3. Find an equation for the tangent to the graph of $f(x) = \ln(x^2 - 1)$ at the point where $x = 2$.

4. Evaluate the definite integral: $\int_2^{e+1} \frac{1}{x-1} dx$

5. Evaluate the integral: $\int \frac{x^2 + x + 1}{x^2 + 1} dx$

6. Determine the area in the region in the first quadrant bounded by $f(x) = \frac{16-x^2}{x}$, the x -axis, and $x=1$.

7. Solve the differential equation: $\frac{dy}{dx} = \sec(2x)$

8. Given $f(x) = x^3 + 5$, find $f^{-1}(x)$.

9. Find $(f^{-1})'(16)$ given $f(x) = \frac{1}{3}x^3 + \frac{5}{3}x + 2$ and $f(3) = 16$.

10. Find $\frac{dy}{dx}$ if $xe^y - x = y^2$.

11. Find the slope of the normal line to the graph of $y = \ln(xe^x)$ at the point where $x = 3$.

12. Evaluate the integral: $\int \frac{e^{3/x}}{x^2} dx$

13. Find $\frac{dy}{dx}$: $y = 5^{2x-3}$.

14. Find $\frac{dy}{dx}$ if $y = \log_5(5x+6)$.

15. Evaluate the integral: $\int 2x^2 5^{x^3} dx$

16. If an annual rate of salary increase averages 3.75% over the next 5 years, then the approximate salary S during any year in that period is $S(t) = P(1.0375)^t$ where t is the time in years and P is the present salary, \$30,000. Find the rate of change of S with respect to t when $t = 4$.