

Homework Set 1

(review topics)

Simplify the following expressions:

1. $\left(\frac{xx^{-3}y^5z^2}{x^2y^3z}\right)^2$

2. $\frac{2}{1+\frac{x}{x-3}}$

3. $\frac{4x^2+x-6}{x^2+3x+2} - \frac{3x}{x+1} + \frac{5}{x+2}$

4. $\ln\left(\frac{(x-1)^2}{x\sqrt{x}}\right)$

5. $\frac{\sin x}{\csc x} + \frac{\cos x}{\sec x}$

Compute the derivative of the given function.

6. $y = 3x^5 - 13x^3 + x^2 - 5$

7. $f(x) = 4e^{1-x^2}$

8. $g(x) = 3^x(x^2 + 4x + 1)$

9. $y = \ln(x^7 - 3x^4 + 6x)$

10. $h(x) = \sin 5x \left(\frac{2x-1}{x+3}\right)^7$