Chain Rule and Implicit Differentiation
Supplemental Instruction
Iowa State University

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Use the chain rule to find derivatives of the following functions.

1. \( f(x) = (x + 3)^2 \)

2. \( f(x) = (x^2 - 1)^3 \)

3. \( f(x) = (x + 3)^2(x^2 - 1)^3 \)  Hint: remember the product rule?

4. \( f(x) = \left[ \frac{(x+3)^2}{(x^2-1)^3} \right]^2 \)

Use implicit differentiation to find \( \frac{dy}{dx} \) for the following functions.

5. \( x + y = 4 \)

6. \( x^2 + 3y^3 = 10 \)

7. \( 5y^2 + 3x = 2y^6 + 7x^2 \)

Use implicit differentiation to find \( \frac{dz}{dx} \) for the following function

8. \( x^2 + y^2 = z^2 \)