Logarithmic Differentiation

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1. Take the natural log of both sides of an equation

2. Use properties of logs to simplify

3. Differentiate both sides (with respect to x)

4. Get all of the $\frac{dy}{dx}$ terms on one side of the equal sign

5. Get all of the other terms on the other side

6. Factor out $\frac{dy}{dx}$

7. Isolate $\frac{dy}{dx}$ by itself (by dividing by the other term)

8. Replace *y* with what it was originally equivalent to.

Find $\frac{dy}{dx}$ by using logarithmic differentiation

1. $y = \sqrt{(x - 1)(x - 2)(x - 3)}$

2. $y = \sqrt{x}(\cdot e)^{x^2}(x^2 + 1)^{10}$