

Logarithmic Differentiation

Differentiate each function using logarithmic differentiation. State the real domain used by the logarithmic derivative formula.

1. Differentiate using logarithmic differentiation.

$$y = 2 \cdot (2 \cdot x^2 + 3)^{2 \cdot x}$$

Required base domain: $2 \cdot (x)^2 + 3 > 0$.

2. Differentiate using logarithmic differentiation.

$$y = -2 \cdot (3 \cdot x^2 + 1)^{\frac{4}{3}} \cdot (3 \cdot x - 1)^{\frac{3}{2}} \cdot (-1 \cdot x + 5)^{\frac{3}{2}}$$

Show the logarithm step and retain every original denominator exclusion.

Math Sheet

Name _____ Score _____ Teacher _____ Date _____

Logarithmic Differentiation

Differentiate each function using logarithmic differentiation. State the real domain used by the logarithmic derivative formula.

3. Differentiate using logarithmic differentiation.

$$y = \frac{(2 \cdot x)^{\frac{2}{3}}}{(-1 \cdot x + 4)^2}$$

Show the logarithm step and retain every original denominator exclusion.

4. Differentiate using logarithmic differentiation.

$$y = -3 \cdot (2 \cdot x + 5)^{-1} \cdot x^{+2}$$

Required base domain: $2 \cdot x + 5 > 0$.

Logarithmic Differentiation

Differentiate each function using logarithmic differentiation. State the real domain used by the logarithmic derivative formula.

5. Differentiate using logarithmic differentiation.

$$y = \left(2 \cdot x^2 + 1\right)^{\frac{3}{2}} \cdot (-3 \cdot x + 4)^3$$

Show the logarithm step and retain every original denominator exclusion.

6. Differentiate using logarithmic differentiation.

$$y = \frac{-2 \cdot (-2 \cdot x + 4)^3 \cdot (2 \cdot x + 4)^3}{\left(3 \cdot x^2 + 1\right)^{\frac{1}{2}}}$$

Show the logarithm step and retain every original denominator exclusion.

Logarithmic Differentiation

Differentiate each function using logarithmic differentiation. State the real domain used by the logarithmic derivative formula.

7. Differentiate using logarithmic differentiation.

$$y = 2 \cdot (x^2 + 3)^{x+1}$$

Required base domain: $(x)^2 + 3 > 0$.

8. Differentiate using logarithmic differentiation.

$$y = -2 \cdot (2 \cdot x^2 + 2)^{\frac{3}{2}} \cdot (3 \cdot x + 2)^{\frac{1}{2}} \cdot (-2 \cdot x + 5)^3$$

Show the logarithm step and retain every original denominator exclusion.

Logarithmic Differentiation

Differentiate each function using logarithmic differentiation. State the real domain used by the logarithmic derivative formula.

9. Differentiate using logarithmic differentiation.

$$y = \frac{(2 \cdot x + 3)^{\frac{2}{3}}}{(-2 \cdot x + 5)^{\frac{1}{3}}}$$

Show the logarithm step and retain every original denominator exclusion.

10. Differentiate using logarithmic differentiation.

$$y = -3 \cdot (x + 5)^{-3} \cdot x^{-1}$$

Required base domain: $x + 5 > 0$.
