Name _____ Score _____ Teacher _____ Date _____

Logarithmic Differentiation

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

1. Differentiate using logarithmic differentiation.

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

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

2. Differentiate using logarithmic differentiation.

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

Show the logarithm step and retain every original denominator exclusion.

The original function domain and the open logarithmic-formula domain are recorded separately.

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*x + 5 > 0.

The original function domain and the open logarithmic-formula domain are recorded separately.

Name _____ Score _____ Teacher _____ Date _____

Logarithmic Differentiation

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

5. Differentiate using logarithmic differentiation.

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

Show the logarithm step and retain every original denominator exclusion.

6. Differentiate using logarithmic differentiation.

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

Show the logarithm step and retain every original denominator exclusion.

The original function domain and the open logarithmic-formula domain are recorded separately.

Name _____ Score _____ Teacher _____ Date _____

Logarithmic Differentiation

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

7. Differentiate using logarithmic differentiation.

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

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

8. Differentiate using logarithmic differentiation.

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

Show the logarithm step and retain every original denominator exclusion.

The original function domain and the open logarithmic-formula domain are recorded separately.

Name _____ Score _____ Teacher _____ Date _____

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: $x + 5 > 0$.

The original function domain and the open logarithmic-formula domain are recorded separately.