Name : _____ Score : _____

Teacher : _____ Date : _____

Logarithmic Differentiation

Differentiate each function using logarithmic differentiation.

1) $f(x) = (5x^2)(7x^2)$

2) $f(x) = \frac{x - 4}{7x^3 + 4x}$

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

4) $f(x) = (-5x^5 + 2x^4 - x^3)(-2x^3)$

5) $f(x) = (x^4 - 6x^3 + 4x)(-4x^3 + 3x)$

6) $f(x) = 2x^{7x}$

7) $f(x) = (-5x^2)(-x^2)$

8) $f(x) = 5x^{2x}$

9) $f(x) = \frac{5x + 1}{4x^2 - 5}$

10) $f(x) = 7x^{5x}$

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Logarithmic Differentiation

Differentiate each function using logarithmic differentiation.

1) $f(x) = (5x^2)(7x^2)$

$f'(x) = 140x^3$

2) $f(x) = \frac{x - 4}{7x^3 + 4x}$

$f'(x) = \frac{-14x^3 + 84x^2 + 16}{49x^6 + 56x^4 + 16x^2}$

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

$f'(x) = \frac{-20x^4 + 75x^2 + 15}{16x^6 + 24x^4 + 9x^2}$

4) $f(x) = (-5x^5 + 2x^4 - x^3)(-2x^3)$

$f'(x) = 80x^7 - 28x^6 + 12x^5$

5) $f(x) = (x^4 - 6x^3 + 4x)(-4x^3 + 3x)$

$f'(x) = -28x^6 + 144x^5 + 15x^4 - 136x^3 + 24x$

6) $f(x) = 2x^{7x}$

$f'(x) = 14x^{7x}(\ln x + 1)$

7) $f(x) = (-5x^2)(-x^2)$

$f'(x) = 20x^3$

8) $f(x) = 5x^{2x}$

$f'(x) = 10x^{2x}(\ln x + 1)$

9) $f(x) = \frac{5x + 1}{4x^2 - 5}$

$f'(x) = \frac{-20x^2 - 8x - 25}{16x^4 - 40x^2 + 25}$

10) $f(x) = 7x^{5x}$

$f'(x) = 35x^{5x}(\ln x + 1)$