

Calculus H  
Ch. 4 #13

Name \_\_\_\_\_

Use logarithmic differentiation to differentiate each function with respect to x.

1.  $y = 2x^{2x}$

2.  $y = 5x^{5x}$

3.  $y = 3x^{3x}$

4.  $y = 4x^{x^4}$

5.  $y = (3x^4 + 4)^3 \sqrt{5x^3 + 1}$

6.  $y = (x^5 + 5)^2 \sqrt{2x^2 + 3}$

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

8.  $y = \sqrt{3x^2 + 1} (3x^4 + 1)^3$

$$9. y = \frac{\sqrt{2x^3 + 3}}{(x^4 - 3)^3}$$

$$10. y = (2x^2 - 5)^3 \sqrt{x^2 - 2}$$

Use logarithmic differentiation to differentiate each function with respect to  $x$ . You do not need to simplify or substitute for  $y$ .

$$11. y = \frac{(5x - 4)^4}{(3x^2 + 5)^5 (5x^4 - 3)^3}$$

$$12. y = (x + 2)^4 (2x - 5)^2 (5x + 1)^3$$

$$13. y = (5x^5 + 2)^2 (3x^3 - 1)^3 (3x - 1)^4$$

$$14. y = \frac{(x^2 + 3)^4}{(5x^5 - 2)^5 (3x^2 - 5)^2}$$

$$15. y = (3x^3 - 4)^5 (3x - 1)^3 (5x^3 - 2)^2 (x + 3)^4$$

$$16. y = \frac{(4x^2 - 5)^2}{(2x - 3)^4 (5x^4 - 2)^5 (3x^2 - 4)^3}$$