

Name: _____

Worksheet on e and ln

Find the Derivative.

1. $Y = e^{1-x}$

2. $Y = e^{-x^2}$

3. $Y = x^2 e^{-x}$

4. $Y = e^{-3/t^2}$

5. $Y = \ln\left(\frac{1+e^x}{1-e^x}\right)$

6. $Y = \ln \frac{e^x + e^{-x}}{2}$

7. $Y = xe^x - e^x$

8. $Y = e^3 \ln x$

9. $Y = \ln x^2$

10. $y = \ln(x\sqrt{x^2-1})$

11. $y = \ln(\ln x)$

12. $y = \ln \sqrt{1+\sin^2 x}$

13. $y = \frac{\ln t}{t^2}$

14. $y = \ln \frac{x}{x^2+1}$

Worksheet on E, LN, & Logarithmic

Date _____

For each problem, find $(f^{-1})'(a)$ by using the theorem $(f^{-1})'(x) = \frac{1}{f'(f^{-1}(x))}$

1) $f(x) = 4x + 3, a = 0$

2) $f(x) = \sqrt{4x + 2}, a = 1$

3) $f(x) = -3x^2 + 5, x \geq 0, a = 2$

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

Differentiate each function with respect to the given variable.

5) $s = \ln r^4$

6) $g(x) = e^{x^5}$

Differentiate each function with respect to x .

7) $y = \ln(e^{4x^5} + 3)$

8) $y = e^{1 + \ln x^5}$

9) $y = \ln \cot 5x^3$

10) $y = \cos e^{3x^5}$

$$11) y = \ln \left(\frac{2x^4}{x^2 + 3} \right)^2$$

$$12) y = \ln \sqrt[3]{\frac{5x^4}{4x^5 + 1}}$$

$$13) y = \frac{e^{5x^2}}{e^{5x^5 + 3}}$$

$$14) y = \frac{e^{x^3}}{e^{5x^4 + 3}}$$

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

$$15) y = 3x^{2x}$$

$$16) y = x^{x^4}$$

$$17) y = \frac{\sqrt[3]{3x+5}}{(5x^5+4)^5}$$

$$18) y = \frac{(4x^5+1)^5 \cdot (5x^4-3)^4}{(5x+4)^2 \cdot (3x+2)^3}$$

Differentiate each function with respect to x .

19) $y = (4x^4 + 3) \cdot e^{5x^5}$

20) $y = \frac{5x^3 + 1}{e^{4x^2}}$

21) $y = \ln 3x^4 \cdot (4x^3 + 3)$

22) $y = \frac{5x^5 - 2}{\ln 4x^4}$