Name_____ Class_____ Date_____

Write each expression as a single natural logarithm.

1. $\ln 16 - \ln 8$

$\ln 2$

2. $3 \ln 3 + \ln 9$

$\ln 243$

3. $a \ln 4 - \ln b$

$\ln \left(\dfrac{4^a}{b} \right)$

Solve each equation. Check your answers. Round your answer to the nearest hundredth.

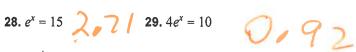**10.** $4 \ln x = -2$

0.61

15. $\ln x + \ln 3x = 14$ 633.14

21. $\ln e^{x+5} = 17$

12

Use natural logarithms to solve each equation. Round your answer to the nearest hundredth.

28. $e^x = 15$ 2.71 **29.** $4e^x = 10$ 0.92

32. $e^{x-4} = 2$

4.69