

1. $\log_5 a + \log_5 b - \log_5 c = \log_5 \frac{ab}{c}$

2. $\log_2 x + 5 \log_2(x-1) + \frac{1}{2} \log_2(x+1) = \log_2 x(x+1)^5 \sqrt{x-1}$

3. $2 \ln 4 - \ln 2 = \ln 16 - \ln 2 = \ln 8$

4. $\frac{1}{3} \ln x - 4 \ln(2x+3) = \ln \frac{\sqrt[3]{x}}{(2x+3)^4}$

5. Use your TI-89 to check your sketch.

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10. $\log_2 x = 3$

$$2^3 = x$$

$$x = 8$$

11. $e^x = 16$

$$\ln e^x = \ln 16$$

$$x = \ln 16$$

12. $\ln(2x-1) = 3$

$$e^3 = 2x-1$$

$$x = \frac{e^3 + 1}{2}$$

13. $3^{x+2} = m$

$$\log_3 3^{x+2} = \log_3 m$$

$$x+2 = \log_3 m$$

$$x = -2 + \log_3 m$$

14. $\ln x = \ln 5 + \ln 8$

$$\ln x = \ln 40$$

$$x = 40$$

15. $\ln(e^{2x-1}) = 5$

$$2x-1 = 5$$

$$x = 3$$

$$16. \quad \ln x + \ln(x-1) = 1$$

$$\ln[x(x-1)] = 1$$

$$\ln(x^2 - x) = 1$$

$$e^1 = x^2 - x$$

$$x^2 - x - e = 0$$

$$x = \frac{1 + \sqrt{4e + 1}}{2}$$

$$17. \quad \ln(\ln x) = 1$$

$$e^1 = \ln x$$

$$\ln x = e$$

$$x = e^e$$

$$18. \quad 2^{3^x} = 5$$

$$\log_2 2^{3^x} = \log_2 5$$

$$3^x = \log_2 5$$

$$\log_3 3^x = \log_3(\log_2 5)$$

$$x = \log_3(\log_2 5)$$

$$19. \quad \ln(x+6) + \ln(x-3) = \ln 5 + \ln 2$$

$$\ln(x^2 + 3x - 18) = \ln 10$$

$$x^2 + 3x - 18 = 10$$

$$x^2 + 3x - 28 = 0$$

$$x = -7 \text{ or } x = 4$$

$$\therefore x = 4 \text{ since } \ln(-7) \nexists$$