Calculus Log and Exponents Practice #3

Solve:

1. $e^{x} = 1.6$

2. $x = \log_9 0.014$

3. $\ln 2x = 5$

4. $3^{x+1} = \frac{2187}{3^{x}}$

5. $\log_5 (\frac{x-1}{2}) = -2$

6. $\sqrt[10]{e^{18x}} = 22.1$

Solve for x in terms of k:

7. $\log_7 (x + 5) = k$

8. $\frac{e^{2x}}{4} = k^2$

Solve:

9. $\log_{10} (x - 6) + \log_{10} (x - 4) = \log_{10} (8)$

10. $\ln (4x - 7) - \ln (x + 5) + \ln (5) = \ln (2x - 3)$

11. $\log_2 (x + 3) = 3 + \log_2 (2x)$

12. $\log_2 (x - 5) + \log_2 (x - 4) = 1$

13. $2 \ln x - 1 = 0$

14. $\log_2 (3x - 6) + \log_2 (x - 4) - \log_2 (2x - 1) = 0$

Solve for x in terms of k:

15. $\log_3 (x) = \log_3 k + 2$

16. $e^{3x} = e^2 + e^{k}$

Answers: Calculus Log and Exponents Practice #3

Solve:

1.	$e^x = 1.6$	$x \ln e = \ln 1.6$	$x = \ln 1.6$	$x = 0.470$
2.	$x = \log_9 0.014$	$9^x = 0.014$	$x \ln 9 = \ln 0.014$	$x = -1.943$
3.	$\ln 2x = 5$	$e^{\ln 2x} = e^5$	$2x = e^5$	$x = 74.2$
4.	$3^{x+1} = \frac{2187}{3^x}$	$3^{2x+1} = 2187$	$(2x + 1) \ln 3 = \ln 2187$	$x = 3$
5.	$\log_5 (\frac{x-1}{2}) = -2$	$5^{\log(\frac{x-1}{2})} = 5^{-2}$	$\frac{x-1}{2} = 0.04$	$x = 1.08$
6.	$\sqrt[10]{e^{18x}} = 22.1$	$e^{1.8x} = 22.1$	$(1.8\,x)$ ~~ln e~~ $= \ln 22.1$	$x = 1.7198$

Solve for x in terms of k:

7.	$\log_7 (x + 5) = k$	$7^{\log(x+5)} = 7^k$	$x + 5 = 7^k$	$x = 7^k - 5$
8.	$\frac{e^{2x}}{4} = k^2$	$e^{2x} = (2k)^2$	$n^{e\wedge(2x)} = 2 \ln 2k$	$x = \ln 2k$

Invalid solutions are shown struck out:

9.	$\log_{10} (x - 6) + \log_{10} (x - 4) = \log_{10} (8)$		$(x - 6)(x - 4) = 4$	$x = 8$ ~~or 2~~
10.	$\ln (4x - 7) - \ln (x + 5) + \ln (5) = \ln (2x - 3)$		$\frac{5(4x-7)}{x+5} = 2x - 3$	$x = 4$ or 2.5
11.	$\log_2 (x + 3) = 3 + \log_2 (2x)$	$(3 = \log_2 8)$	$x + 3 = 8 \times 2x$	$x = 0.2$
12.	$\log_2 (x - 5) + \log_2 (x - 4) = 1$	$(1 = \log_2 2)$	$(x - 5)(x - 4) = 2$	$x = 6$ ~~or 3~~
13.	$2 \ln x - 1 = 0$	$\ln (x^2) = \ln e$	$x^2 - e = 0$	$x = \sqrt{e}$ ~~or $-\sqrt{e}$~~
14.	$\log_2 (3x - 6) + \log_2 (x - 4) - \log_2 (2x - 1) = 0$		$\frac{(3x-6)(x-4)}{2x-1} = 1$	$x = 5$ ~~or 1.66~~

Solve for x in terms of k:

15.	$\log_3 (x) = \log_3 k + 2$	$\log_3 (x) = \log_3 k + \log_3 9$	$\log_3 (x) = \log_3 9k$	$x = 9k$
16.	$e^{3x} = e^2 + e^k$	$e^{3x} = e^{k+2}$	$3x = k + 2$	$x = \frac{k+2}{3}$