Calculus Log and Exponents Practice #1

Solve:

1. $x = \log_6 200$

2. $\ln x = 2.1$

3. $e^x = 9$

4. $\log_5 (3x + 11) = 6.2$

5. $e^{2-x} = 3.1$

6. $\frac{5^{4x}}{5^{x-4}} = 199$

Solve for x in terms of k:

7. $\log_{10} (4x) = k$

8. $\ln (2x - 5) = k$

Solve:

9. $\log_{10} (x + 8) + \log_{10} (x - 5) = \log_{10} (14)$

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

11. $\log_3 (2x + 3) - \log_3 (x - 2) = 1$

12. $\log_2 (x + 4) + \log_2 (x - 3) = 3$

13. $2 \log_2 (x) - \log_2 (x - 6) = \log_2 32$

14. $\log_3 (x^5) - 3 \log_3 (x) = 4$

Solve for x in terms of k:

15. $2 \log_4 x = \log_4 k + 1$

16. $\ln (2x - k) - \ln k = 2$

Answers: Calculus Log and Exponents Practice #1

Solve:

1.	$x = \log_6 200$	$6^x = 200$	$x \ln 6 = \ln 200$	$x = 2.957$
2.	$\ln x = 2.1$	$e^{\ln x} = e^{2.1}$	$x = e^{2.1}$	$x = 8.166$
3.	$e^x = 9$	$x \ln e = \ln 9$	$x = \ln 9$	$x = 2.197$
4.	$\log_5 (3x + 11) = 6.2$	$5^{\log (3x + 1)} = 5^{6.2}$	$3x + 11 = 21558.3$	$x = 7182.4$
5.	$e^{2 - x} = 3.1$	$(2 - x)$ ~~ln e~~ $= \ln 3.1$	$2 - x = 1.1314$	$x = 0.8686$
6.	$\frac{5^{4x}}{5^{x-4}} = 199$	$5^{3x + 4} = 199$	$(3x + 4) \ln 5 = \ln 199$	$x = -0.2370$

Solve for x in terms of k:

7.	$\log_{10} (4x) = k$	$10^{\log (4x)} = 10^k$	$4x = 10^k$	$x = \frac{10^k}{4}$
8.	$\ln (2x - 5) = k$	$e^{\ln (2x - 5)} = e^k$	$2x - 5 = e^k$	$x = \frac{e^k + 5}{2}$

Invalid solutions are shown struck out:

9.	$\log_{10} (x + 8) + \log_{10} (x - 5) = \log_{10} (14)$		$(x + 8)(x - 5) = 14$	$x = 6$ ~~or -9~~
10.	$\ln (5x - 6) + \ln (3) = 2 \ln (x) + \ln (2)$		$3(5x - 6) = 2x^2$	$x = 6$ or 1.5
11.	$\log_3 (2x + 3) - \log_3 (x - 2) = 1$	$(1 = \log_3 3)$	$\frac{2x + 3}{x - 2} = 3$	$x = 9$
12.	$\log_2 (x + 4) + \log_2 (x - 3) = 3$	$(3 = \log_2 8)$	$(x + 4)(x - 3) = 8$	$x = 4$ ~~or -5~~
13.	$2 \log_2 (x) - \log_2 (x - 6) = \log_2 32$		$\frac{x^2}{x - 6} = 32$	$x = 8$ or 24
14.	$\log_3 (x^5) - 3 \log_3 (x) = 4$	$(4 = \log_3 81)$	$x^{5 - 3} = 81$	$x = 9$ ~~or -9~~

Solve for x in terms of k:

15.	$2 \log_4 x = \log_4 k + 1$	$\log_4 x^2 = \log_4 k + \log_4 4$	$x^2 = 4k$	$x = 2\sqrt{k}$
16.	$\ln (2x - k) - \ln k = 2$	$\ln (\frac{2x - k}{k}) = \ln e^2$	$\frac{2x - k}{k} = e^2$	$x = \frac{e^2 k + k}{2}$