Pre-Calculus

Simplify each of the following. Your final answer should contain no radicals.

(1) $\log_5 5 = 1$

(2) $\log_9 3 = \frac{1}{2}$ HW

(3) $\log_{16} 2 = \frac{1}{4}$ HW

(4) $\log_9 \frac{1}{9} = -1$

(5) $\log_{\frac{1}{9}} 9 = -1$

(6) $\log_3 \frac{1}{9} = -2$

(7) $\log_5 25 = 2$

(8) $\ln e = 1$

(9) $\log_{\sqrt{2}} 4 = 4$

(10) $\log_4 \sqrt{2} = \frac{1}{2 \cdot 2} = \frac{1}{4}$

(11) $\log_5 \frac{1}{25} = -2$

(12) $\log_2 (-2) = \emptyset$

(13) $\log_{125} 5 = \frac{1}{3}$

(14) $\log_{\frac{3}{2}} \frac{3}{2} = -1$

(15) $\log_8 32 = \frac{5}{3}$

(16) $\ln 1 = 0$

(17) $\log_{\frac{2}{3}} \frac{27}{8} = -3$

(18) $\log_e e^2 = 2$

(19) $\log_{144} 12 = \frac{1}{2}$

(20) $\log_8 4 = \frac{2}{3}$

(21) $\log_{\frac{1}{3}} 9 = -2$

(22) $\log_8 2 = \frac{1}{3}$

(23) $\log_2 8 = 3$

(24) $\log_3 1 = 0$

(25) $\log_b 1 = 0$

(26) $\log_{10} \frac{1}{100} = -2$

(27) $3 \log_4 2$
$\log_4 8 = \frac{3}{2}$

(28) $\log_{16} 2 = \frac{1}{4}$

(29) $\log_{125} 25 = \frac{2}{3}$

(30) $\log_{b^2} b = \frac{1}{2}$

(31) $3^{2 \log_3 6} = 3^{\log_3 36} = 36$

(32) $\log_9 \frac{1}{3} = -\frac{1}{2}$

(33) $2^{\log_2 5} = 5$

(34) $\log_{\frac{1}{2}} \frac{1}{4} =$

(35) $\log_b \sqrt{b} = \frac{1}{2}$

(36) $\log_{27} 3 = \frac{1}{3}$

(37) $\ln e^2 = 2$

(38) $e^{\ln 3} = 3$

(39) $\log_{25} 125 = \frac{3}{2}$

(40) $\log_4 \frac{\sqrt{8}}{2} = \frac{1}{4}$

(41) $\log_7 \sqrt{7} = \frac{1}{2}$

(42) $\log_{100} 10 = \frac{1}{2}$

(43) $e^{2 \ln 5} = e^{\ln 25} = 25$

(44) $e^{-3 \ln 2} = 2^{-3} = \frac{1}{8}$

(45) $e^{\ln 7} = 7$

(46) $\log_5 125 = 3$

(47) $\log_{1000} 10 = \frac{1}{3}$

(48) $\log_{64} \frac{1}{8} = -\frac{1}{2}$

(49) $\log_3 \frac{1}{27} = -3$

(50) $\log_{64} 8 = \frac{1}{2}$

(51) $\log_9 \frac{1}{27} = -\frac{3}{2}$

(52) $\log_{25} 5 = \frac{1}{2}$

(53) $\log_4 2 = \frac{1}{2}$

(54) $\log_2 2\sqrt{2} = \frac{3}{2}$

(55) $\log_{\frac{1}{25}} 5 = -\frac{1}{2}$

(56) $\ln e^3 = 3$

(57) $\log 10^b = b$

(58) $\log_{10} 1000 = 3$

(59) $\log_{\sqrt{7}} 7 = 2$

(60) $\log_4 \frac{1}{2} = -\frac{1}{2}$

(61) $\log 10^5 = 5$

(62) $\log_4 32 = \frac{5}{2}$

(63) $\log_{36} 6 = \frac{1}{2}$

(64) $\log_{\frac{1}{27}} 9 = -\frac{2}{3}$

(65) $\log_9 27 = \frac{3}{2}$

(66) $\log_{\sqrt{2}} 4 = 4$

(67) $\log_{\frac{2}{5}} \frac{8}{125} = -3$

(68) $\log_8 \frac{2}{\sqrt{8}} = -\frac{1}{6}$
$(2^3)^x = \frac{2}{2^{3/2}}$

(69) $e^{\ln 3} e^{\ln 2}$
$3 \cdot 2 = 6$

(70) $\log_2 4 \log_3 9$
$2 \cdot 2 = 4$

(73) $\log_{10} 10^5 = 5$

(76) $\log_b \frac{\sqrt{b}}{b^2} = -\frac{3}{2}$

(79) $(e^{\ln 3})^2 = (3)^2 = 9$

(82) $\log_b \sqrt{b} = \frac{1}{2}$

(85) $\log \sqrt{10} = \frac{1}{2}$

(88) $\log_{\frac{1}{b}} b = -1$

(71) $\log_2 (2^3 4^5)$
$\log_2 (2^3 \cdot 2^{10}) = 13$

(74) $2 \log_3 9$
$2 \cdot 2 = 4$

(77) $\log_6 \sqrt{12} + \log_6 \sqrt{3}$
$\log_6 \sqrt{36} = 1$

(80) $\log_9 \left(27^{1/3}\right)$
$\log_9 (3) = \frac{1}{2}$

(83) $b^{\log_b 3} = 3$

(86) $\ln \sqrt{e} = \frac{1}{2}$

(89) $\frac{1}{\log_{\frac{1}{2}} 4} = -\frac{1}{2}$

(72) $\log_8 \frac{\sqrt{2}}{\sqrt{8}} = \log_{2^3} \frac{2^{1/2}}{2^{3/2}} = -\frac{1}{6}$

(75) $\frac{\log_4 8}{\log_3 \frac{1}{9}} = \frac{\frac{3}{2}}{-2} = \frac{3}{2} \cdot -\frac{1}{2} = -\frac{3}{4}$

(78) $(\log_9 27)^2 = \left(\frac{3}{2}\right)^2 = \frac{9}{4}$

(81) $\log_9 81 + \log_{81} 9$
$2 + \frac{1}{2} = \frac{5}{2}$

(84) $b^{3 \log_b 5}$
125

(87) $\log_3 3\sqrt{3} - \log_3 \sqrt{3}$
$\log_3 \frac{3\sqrt{3}}{\sqrt{3}}$
$\log_3 3 = 1$

(90) $\frac{\log_4 8}{2}$
$\frac{3}{2} \div 2$
$\frac{3}{2} \cdot \frac{1}{2} = \frac{3}{4}$