

Logarithms

A) Evaluate each Logarithm Expression without a calculator.

<b>1</b>	$\log_7 49$	<b>2</b>	$\log_3 27$	<b>3</b>	$\log_{10} \frac{1}{10}$	<b>4</b>	$\log_2 \frac{1}{16}$
<b>5</b>	$\log_{\frac{1}{4}} 16$	<b>6</b>	$\log_{\frac{1}{2}} 8$	<b>7</b>	$\log_7 1$	<b>8</b>	$\log_{\frac{1}{6}} 6$
<b>9</b>	$\log \frac{1}{100}$	<b>10</b>	$\log_{14} 1$	<b>11</b>	$\log 10000$	<b>12</b>	$\log_{\frac{1}{3}} 81$

B) Evaluate each Logarithm Expression without a calculator.

<b>1</b>	$\log_3 3$	<b>2</b>	$\log 10$	<b>3</b>	$\log_5 (5^4)$	<b>4</b>	$\log_8 (8^5)$
<b>5</b>	$6^{\log_6 11}$	<b>6</b>	$7^{\log_7 2}$	<b>7</b>	$\log_{10} (10^3)$	<b>8</b>	$\log_9 (9^{15})$
<b>9</b>	$\log_3 1$	<b>10</b>	$\log_{18} 1$	<b>11</b>	$10^{\log 5}$	<b>12</b>	$\log_{\frac{1}{3}} \left( \frac{1}{3} \right)$

C) Evaluate each Logarithm Expression without a calculator.

<b>1</b>	$\log_2 1 + \log_2 (2^3)$	<b>2</b>	$\log 10^4 + \log 10$	<b>3</b>	$\log_4 4 + \log_2 1$
<b>4</b>	$\log_7 7 + \log_4 (4^2)$	<b>5</b>	$\log_{\frac{1}{4}} \left( \frac{1}{4} \right)^{2x}$	<b>6</b>	$\log_{\frac{2}{3}} \left( \frac{2}{3} \right)^p$

D) Simplify each Logarithmic expression without a calculator. Evaluate each log individually then add.

<b>1</b>	$\log_4 (64) + \log_5 (125)$	<b>2</b>	$\log_7 (49) + \log_6 (36)$	<b>3</b>	$\log_9 (81) + \log_9 (1)$
<b>4</b>	$\log_5 (25) + \log_5 \left( \frac{1}{125} \right)$	<b>5</b>	$\log_{\frac{1}{2}} (16) + \log_2 \left( \frac{1}{16} \right)$	<b>6</b>	$\log_{\frac{1}{3}} (27) + \log_{\frac{1}{3}} (81)$
<b>7</b>	$\log_{\frac{1}{2}} (8) + \log_{\frac{1}{2}} \left( \frac{1}{8} \right)$	<b>8</b>	$\log_{\frac{1}{4}} \left( \frac{1}{4} \right) + \log_{\frac{1}{4}} \left( \frac{1}{16} \right)$	<b>9</b>	$\log_2 (8) + \log_4 (16)$

E) Simplify each Logarithmic expression without a calculator.

<b>1</b>	$\log_{12} (144) - \log_{12} (12)$	<b>2</b>	$\log_4 (16) - \log_4 (64)$	<b>3</b>	$\log (100) - \log (1000)$
<b>4</b>	$\log_2 (32) - \log_2 \left( \frac{1}{8} \right)$	<b>5</b>	$\log_2 \left( \frac{1}{4} \right) - \log_2 (128)$	<b>6</b>	$\log_{\frac{1}{2}} \left( \frac{1}{4} \right) + \log_{\frac{1}{2}} (4)$

<b>7</b>	$\log_3(81) - \log_3\left(\frac{1}{81}\right)$	<b>8</b>	$\log_{\frac{1}{3}}(27) - \log_{\frac{1}{3}}\left(\frac{1}{9}\right)$	<b>9</b>	$\log(200) - \log(2)$
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F) Use the **PROPERTIES** to simplify each Logarithmic expression.

<b>1</b>	$\log_4(64) + \log_3(81)^5$	<b>2</b>	$\log_2(32)^3 + \log_3(27)^8$	<b>3</b>	$\log_6(36)^{-3} + \log_7(49)^{-2}$
<b>4</b>	$\log_2(16)^5 + \log_2(64)^{-2}$	<b>5</b>	$\log_2(16)^{-5} - \log_8(64)$	<b>6</b>	$\log_{\frac{1}{2}}(32) - \log_{\frac{1}{4}}(64)^5$
<b>7</b>	$\log_{\frac{1}{2}}(32) + \log_{\frac{1}{4}}(64)^5$	<b>8</b>	$\log_{\frac{1}{8}}\left(\frac{1}{64}\right) + \log\left(\frac{1}{100}\right)$	<b>9</b>	