Questions from Homework

* ⑥ f) $5^{(\log_5 8 - \log_5 2)}$

$= 5^{\log_5 (\frac{8}{2})}$

$= 5^{\log_5 4}$

$= 4$

⑧ $3^{\log_3 27} + 10^{\log_{10} 1000}$ $\qquad b^{\log_b m} = m$

$27 + 1000$

1027

⑥ b) $\log_6 (\log_2 64)$

base, ans.

$6^y = \log_2 64$

$6^y = 6^1$

$\boxed{y = 1}$

* $2^y = 64$

$2^y = 2^6$

$y = 6$

④ i) $x = \log_2 8\sqrt{2}$

$x = \boxed{\frac{7}{2}}$

* $2^y = 8\sqrt{2}$

$2^y = (2)^3 (2)^{\frac{1}{2}}$

$2^y = 2^{3+\frac{1}{2}}$

$2^y = 2^{7/2}$

$y = 7/2$

Logarithms

exponential form

$$x = b^y$$

Say "the base ***b*** to the exponent ***y*** is ***x***."

logarithmic form

$$y = \log_b x$$

Say "***y*** is the exponent to which you raise base ***b*** to get the answer ***x***."

$$x = b^y \longleftrightarrow y = \log_b x$$

Product Law for Logarithms

$$\log_b M + \log_b N = \log_b (MN)$$

Example 1

$$\log_3 54 + \log_3 \left(\frac{3}{2}\right)$$

$= \log_3 \left(54 \times \frac{3}{2}\right)$

$= \log_3 81$

$= 4$

Quotient Law for Logarithms

$$\log_b M - \log_b N = \log_b \left(\frac{M}{N} \right)$$

Example 2

$\log_3 24 - \log_3 6$

$= \log_3 \left(\frac{24}{6}\right)$

$= \log_3 4$

$= 2$

Homework

Omit #7 of Exercise 4.6

⑤ $\log_{10} 2 = 0.3010$

$\log_{10} 5 = 0.6990$

$\log_{10} 7 = 0.8451$

a) $\log_{10} 4$

$\log_{10} 2 + \log_{10} 2$

$0.3010 + 0.3010$

0.6020

b) $\log_{10} 10$

$\log_{10} 2 + \log_{10} 5$

$0.3010 + 0.6990$

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