Precalculus Name_____

3.3B Evaluating logarithms using properties Period_____Date_____

Use the properties of logarithms to write the logarithm in terms of $\log_3 5$ and $\log_3 7$.

1. $\log_3 35$	2. $\log_3 \frac{5}{7}$
3. $\log_3 \frac{7}{25}$	4. $\log_3 175$
5. $\log_3 \frac{21}{5}$	6. $\log_3 \frac{45}{49}$

Approximate the logarithm using the properties of logarithms, given $\log_b 2 \approx 0.3562$, $\log_b 3 \approx 0.5646$, and $\log_b 5 \approx 0.8271$.

7. $\log_b 10$	8. $\log_b \frac{3}{5}$
9. $\log_b 0.04$	10. $\log_b \sqrt{2}$

Approximate the logarithm using the properties of logarithms, given $\log_b 2 \approx 0.3562$, $\log_b 3 \approx 0.5646$, and $\log_b 5 \approx 0.8271$.

11. $\log_b 45$	12. $\log_b(3b^2)$
13. $\log_b(2b)^{-2}$	14. $\log_b \sqrt[3]{3b}$

Use the properties of logarithm and the values below to find the logarithm indicated. Do not use a calculator to evaluate the logs.

15. $\log 7 \approx 0.8$ $\log 8 \approx 0.9$ $\log 12 \approx 1.1$ Find: $\log \frac{1}{49}$	16. $\log 7 \approx 0.8$ $\log 8 \approx 0.9$ $\log 12 \approx 1.1$ Find: $\log \frac{1}{64}$
17. $\log 7 \approx 0.8$ $\log 8 \approx 0.9$ $\log 12 \approx 1.1$ Find: $\log 64$	18. $\log 7 \approx 0.8$ $\log 8 \approx 0.9$ $\log 12 \approx 1.1$ Find: $\log 84$

Use the properties of logarithm and the values below to find the logarithm indicated. Do not use a calculator to evaluate the logs.

19. $\log_4 9 \approx 1.6$ $\log_4 6 \approx 1.3$ $\log_4 7 \approx 1.4$ Find: $\log_4 \frac{2}{27}$	20. $\log_5 6 \approx 1.1$ $\log_5 7 \approx 1.2$ $\log_5 9 \approx 1.4$ Find: $\log_5 \frac{1}{4}$
21. $\log_7 11 \approx 1.2$ $\log_7 8 \approx 1.1$ $\log_7 12 \approx 1.3$ Find: $\log_7 \frac{12}{121}$	22. $\log_7 6 \approx 0.9$ $\log_7 8 \approx 1.1$ $\log_7 10 \approx 1.2$ Find: $\log_7 \frac{7}{36}$

Use the properties of logarithm and the logarithms provided below to rewrite each logarithm in terms of the variables given.

23. $\log_4 6 = X$ $\log_4 7 = Y$ $\log_4 10 = Z$ Find: $\log_4 \frac{500}{3}$	24. $\log_8 6 = R$ $\log_8 9 = S$ $\log_8 10 = T$ Find: $\log_8 \frac{1}{800}$

Use the properties of logarithm and the logarithms provided below to rewrite each logarithm in terms of the variables given.

25. $\log_8 6 = M$ $\log_8 10 = P$ $\log_8 9 = Q$ Find: $\log_8 \frac{1}{125}$	26. $\log_5 7 = X$ $\log_5 8 = Y$ $\log_5 12 = Z$ Find: $\log_5 \frac{5}{18}$