Common Logs

Common Log:

- Use to represent values with a base of 10
- Often written without the base:
  - Written as: $y = \log x$
  - Means: $10^y = x$

Examples:

- If $\log 100 = 2\ then\ 10^2 = 100$
- If $\log 0.1 = -1\ then\ 10^{-1} = 0.1$
- If $\log 10{,}000 = 4\ then\ 10^4 = 10{,}000$
- If $\log 0.00001 = -5\ then\ 10^{-5} = 0.00001$

Change of Base:

$$log_3 5 = \frac{\log 5}{\log 3}$$

Practice: Determine the value of each

1. $\log 1{,}000$
2. $\log_{\mathbf{2}}\mathbf{4}$
3. $\log_{\mathbf{3}}\mathbf{9}$
4. $\log_{\mathbf{5}}\mathbf{0.2}$
5. $\log_4 64$
6. $\log_6 36$
7. $\log 10^8$
8. $\log 100{,}000$
9. $\log_{\mathbf{2}}\mathbf{32}$
10. $\log_{\mathbf{3}}\mathbf{27}$
11. $\log_{\mathbf{5}}\frac{\mathbf{1}}{\mathbf{125}}$
12. $\log_4 \frac{1}{64}$
13. $\log_{36} 6$
14. $\log_2 2^8$
15. $\log 0.01$
16. $\log_{\mathbf{2}}\mathbf{64}$
17. $\log_{\mathbf{3}}\mathbf{243}$
18. $\log_{\mathbf{5}}\sqrt[\mathbf{3}]{\mathbf{5}}$
19. $\log_4 \sqrt[4]{4}$
20. $\log_6 6\sqrt{6}$
21. $\log_5 5^8$
22. $\log 0.0001$
23. $\log_{\mathbf{2}}\mathbf{2^{10}}$
24. $\log_{\mathbf{3}}\mathbf{3^8}$
25. $\log_{\mathbf{5}}\mathbf{1}$
26. $\log_4 1$
27. $\log_6 \sqrt[3]{\frac{1}{6}}$
28. $\log 10^{\frac{1}{2}}$