$$
\begin{gathered}
\text { 13. } \log _{10} z+\log _{10}(z+3)=1 \\
\log _{10}\left(z^{2}+3 z\right)=1 \\
10^{\prime}=z^{2}+3 z \\
-10=z^{2}+3 z-10 \\
z=\frac{-3 \pm \sqrt{3^{2}-4(1)(-10)}}{2(1)} \\
=\frac{-3 \pm \sqrt{49}}{2}=\frac{-3 \pm 7}{2}=\frac{-3+7}{2}, \frac{-3-7}{2} \\
z=2
\end{gathered}
$$

11. $\log _{2} n=\frac{1}{4} \log _{2} 16+\frac{1}{2} \log _{2} 49$

$$
=\log _{2} 16^{\frac{1}{4}}+\log _{2} 49^{\frac{1}{2}}
$$

$$
\begin{aligned}
& 16^{\frac{1}{4}}=\sqrt[4]{16} \\
& 49^{\frac{1}{2}}=\sqrt{49}
\end{aligned}
$$

$$
V=\log _{2} 2+\log _{2} 7
$$

$$
\log _{2} n=\log _{2} 14
$$

$$
n=14
$$

$$
\text { 10. } \begin{gathered}
\log _{7} 24-\log _{7}(y+5)=\log _{7} 8 \\
\log _{7} \frac{24}{y+5}=\log _{7} 8 \\
(y+5) \frac{24}{y+5}=8(y+5) \\
24=8 y+40 \\
-16=8 y \\
-2=y
\end{gathered}
$$

$$
\text { 6. } \log _{6}(x+4)+\log _{6} 2 x
$$

