Sec 1.5 \# 21
(21)

$$
\begin{aligned}
& f(x)=1+\sqrt{2+3 x} \\
& y=f(x)=1+\sqrt{2+3 x}, y \geqslant 1 . \\
& y-1=\sqrt{2+3 x} \\
& (y-1)^{2}=2+3 x \\
& (y-1)^{2}-2=3 x \\
& \frac{(y-1)^{2}-2}{3}=x \\
& f^{-1}(x)=\frac{1}{3}(x-1)^{2}-\frac{2}{3}, x \geqslant 1
\end{aligned}
$$

(22) $y=f(x)=\frac{4 x-1}{2 x+3}$

Sec 1.5 \# 37
(a)

$$
\begin{aligned}
\log _{10} 40+\log _{10} 2.5 & \left.=\log _{10}(140)(2.5)\right) \\
& =\log _{10} 100 \\
& =\log _{10} 10^{2} \\
& =\frac{2}{1} \log _{10}^{10} \\
& =2
\end{aligned}
$$

(b)

$$
\begin{aligned}
\log _{8} 60-\log _{8} 3-\log _{8}^{5} & =\log _{8} \frac{60}{3}-\log _{8} 5 \\
& =\log _{8} 20-\log _{8} 5 \\
& =\log _{8} \frac{20}{5}=\log _{8} 4=\log _{2}^{2^{2}} \\
& =\frac{2}{3}
\end{aligned}
$$

Sec 1.5 \# 51
(a)

$$
\begin{aligned}
e^{7-4 x}=6 & \Leftrightarrow \ln e^{7-4 x}=\ln 6 \\
& \Leftrightarrow(7-4 x) \ln e=\ln 6 \\
& \Leftrightarrow 7-4 x=\ln 6 \\
& \Leftrightarrow 7-\ln 6=4 x \\
& \Leftrightarrow \frac{7}{4}-\frac{1}{4} \ln 6=x
\end{aligned}
$$

(b)

$$
\begin{aligned}
\ln (3 x-10)=2 & \Leftrightarrow e^{\ln (3 x-10)}=e^{2} \\
& \Leftrightarrow 3 x-10=e^{2} \\
& \Leftrightarrow 3 x=10+e^{2} \\
& \Leftrightarrow x=\frac{10}{3}+\frac{e^{2}}{3} \\
& =\frac{1}{3}\left(10+e^{2}\right)
\end{aligned}
$$

Sec 1.5 \# 56
(a)

$$
\begin{aligned}
1<e^{3 x-1}<2 & \Rightarrow \ln 1<\ln e^{3 x-1}<\ln 2 \\
& \Rightarrow 0<3 x-1<\ln 2 \\
& \Rightarrow 1<3 x<1+\ln 2 \\
& \Rightarrow \frac{1}{3}<x<\frac{1}{3}(1+\ln 2)
\end{aligned}
$$

(b)

$$
\begin{aligned}
1-2 \ln x<3 & \Rightarrow 1-3<2 \ln x \\
& \Rightarrow-2<2 \ln x \\
& \Rightarrow-1<\ln x \\
& \Rightarrow e^{-1}<e^{\ln x}=x \\
& \Rightarrow e^{-1}<x \text { or } x>e^{-1}
\end{aligned}
$$

63a $\cos ^{-1}(-1)=\pi$ since $\cos \pi=-1$ and $\cos \theta$ is assume o $|\sim|$ in $[0, \pi]$.

(b) $\sin ^{-1}(0.5)=\frac{\pi}{6}$ since $\sin \frac{\pi}{6}=0.5$ and $\sin \theta$ is $1-1$ on $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$


64 (6) $\tan ^{-1} \sqrt{3}=\frac{\pi}{3}$ since $\tan \frac{\pi}{3}=\sqrt{3}$ and $\tan \theta$ is assumed $1-1$ on $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$


(b) $\arctan (-1)=-\frac{\pi}{4}$ since tan $\left(-\frac{\pi}{4}\right)=-1$ and $\tan \theta$ is assumed $1-1$ on $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

