$$
\begin{gathered}
\text { HQ } 9.2 \text { Day } 1 \\
\text { p. } 458
\end{gathered}
$$

$$
\# 2-10 \text { even }
$$

(2) $\lim _{x \rightarrow 0} \frac{\sin (5 x)}{x}=5$
check: $\frac{\sin (5.0)}{0}=\frac{0}{0}$ : Can use 1 'lồsp. Rule

$$
\lim _{x \rightarrow 0} \frac{\sin (5 x)}{x}=\frac{\cos (5 \cdot 0) \cdot 5}{1}=\frac{1 \cdot 5}{1}=55
$$

(4) $\lim _{x \rightarrow 1} \frac{\sqrt[3]{x}-1}{x-1}=\frac{1}{3}$
check: $\frac{\sqrt[3]{1}-1}{1-1}=\frac{0}{0}:$ Can use 1'Hôsp. Rule

$$
\lim _{x \rightarrow 1} \frac{\sqrt[3]{x}-1}{x-1}=\frac{\frac{1}{3}(1)^{-2 / 3}}{1}=\frac{1}{3}
$$

(6) $\lim _{\theta \rightarrow \frac{\pi}{2}} \frac{1-\sin \theta}{1+\cos (2 \theta)}=\frac{1-\sin \frac{\pi}{2}}{1+\cos (\pi)}=\frac{0}{0}$
can use I'Hospital's Rule

$$
\begin{gathered}
\lim _{\theta \rightarrow \frac{\pi}{2}} \frac{1-\sin \theta}{1+\cos (2 \theta)}=\lim _{\theta \rightarrow \frac{\pi}{2}-2 \sin (2 \theta)} \frac{-\cos \theta}{-2 \operatorname{tin}}=\frac{\sin \frac{\pi}{2}}{-4 \cos \left(2 \cdot \frac{\pi}{2}\right)}=\frac{1}{4} \\
\operatorname{still} \frac{1}{0}
\end{gathered}
$$

(8)

$$
\begin{aligned}
& \lim _{x \rightarrow 2} \frac{x^{2}-4 x+4}{x^{3}-12 x+16}=\frac{2^{2}-4(2)+4}{2^{3}-12(2)+16}=\frac{0}{0} \quad \text { Can use l'H8sp. Rule } \\
& =\lim _{x \rightarrow 2} \frac{2 x-4}{3 x^{2}-12}=\frac{2(2)-4}{3(2)^{2}-12}=\frac{0}{0} \quad \text { L.R. again } \\
& \quad=\lim _{x \rightarrow 2} \frac{2}{6 x}=\frac{2}{6(2)}=\frac{1}{6}
\end{aligned}
$$

(10) a) $\lim _{x \rightarrow 0^{-}} \frac{\tan x}{x}=\frac{0}{0}$ Apply l'Hosp. Rule b) $\lim _{x \rightarrow 0^{+}} \frac{\tan x}{x}=\frac{0}{0}$ Apply L. R.

$$
=\lim _{x \rightarrow 0^{-}} \frac{\sec ^{2} x}{1}=\frac{\sec ^{2} 0}{1}=1
$$

$$
\begin{aligned}
& \text { b) } \lim _{x \rightarrow 0^{+}} \frac{\tan x}{x}=\frac{0}{0} \text { Apply L,R. } \\
& =\lim _{x \rightarrow 0^{+}} \frac{\sec ^{2} x}{1}=1
\end{aligned}
$$

