

Four Forms of Valid Reasoning

$$P \rightarrow Q$$

$$P$$

$$\therefore Q$$

by MP

$$P \rightarrow Q$$

$$\sim Q$$

$$\therefore \sim P$$

by MT

$$P \rightarrow Q$$

$$Q \rightarrow R$$

$$\therefore P \rightarrow R$$

by LS

$$P \rightarrow Q$$

$$\therefore \sim Q \rightarrow \sim P$$

by LC

EXERCISE SET B

Determine whether or not each logical argument is valid. If the argument is valid, tell what logical reasoning pattern or patterns are involved (MP, MT, LS, LC). If the argument is not valid, write *no valid conclusion*.

$$\begin{array}{l} 1. \quad P \rightarrow Q \\ \quad P \\ \hline \therefore Q \end{array}$$

$$\begin{array}{l} 2. \quad R \rightarrow S \\ \quad S \\ \hline \therefore R \end{array}$$

$$\begin{array}{l} 3. \quad P \rightarrow R \\ \quad \sim R \\ \hline \therefore \sim P \end{array}$$

$$\begin{array}{l} 4.* \quad \sim P \rightarrow S \\ \quad \sim P \\ \hline \therefore S \end{array}$$

$$\begin{array}{l} 5. \quad P \rightarrow Q \\ \quad \sim P \\ \hline \therefore \sim Q \end{array}$$

$$\begin{array}{l} 6. \quad R \rightarrow P \\ \quad P \rightarrow S \\ \hline \therefore R \rightarrow S \end{array}$$

$$\begin{array}{l} 7. \quad S \rightarrow P \\ \quad R \rightarrow P \\ \hline \therefore S \rightarrow R \end{array}$$

$$\begin{array}{l} 8. \quad \sim(P \rightarrow Q) \\ \hline \therefore \sim P \rightarrow \sim Q \end{array}$$

$$\begin{array}{l} 9.* \quad P \rightarrow Q \\ \quad Q \rightarrow S \\ \quad S \rightarrow T \\ \hline \therefore P \rightarrow T \end{array}$$

$$\begin{array}{l} 10. \quad P \rightarrow \sim Q \\ \quad Q \\ \hline \therefore \sim P \end{array}$$

$$\begin{array}{l} 11. \quad \sim Q \rightarrow \sim R \\ \quad R \\ \hline \therefore Q \end{array}$$

$$\begin{array}{l} 12. \quad \sim S \rightarrow P \\ \quad R \rightarrow \sim S \\ \hline \therefore R \rightarrow P \end{array}$$

$$\begin{array}{l} 13. \quad P \rightarrow Q \\ \quad \sim R \rightarrow \sim Q \\ \hline \therefore P \rightarrow R \end{array}$$

$$\begin{array}{l} 14.* \quad \sim T \rightarrow \sim Q \\ \quad S \rightarrow Q \\ \hline \therefore S \rightarrow T \end{array}$$

$$\begin{array}{l} 15. \quad R \\ \quad R \rightarrow (P \rightarrow T) \\ \hline \therefore P \rightarrow T \end{array}$$

$$\begin{array}{l} 16. \quad (P \rightarrow Q) \rightarrow R \\ \quad P \rightarrow Q \\ \quad R \rightarrow S \\ \hline \therefore S \end{array}$$