

# Story Problems - How KEY

①  $A \vee \sim S \checkmark$

$R \rightarrow \sim A \checkmark$

$\sim R \rightarrow C$

$S \checkmark$

$\therefore C$

$\left. \begin{array}{l} \textcircled{1} A \vee \sim S \\ \textcircled{2} S \end{array} \right\} \rightarrow \textcircled{3} A$   
 $\left. \begin{array}{l} \textcircled{3} A \\ \textcircled{4} R \rightarrow \sim A \end{array} \right\} \rightarrow \textcircled{5} \sim R$   
 $\left. \begin{array}{l} \textcircled{5} \sim R \\ \textcircled{6} \sim R \rightarrow C \end{array} \right\} \rightarrow \textcircled{7} C$

The butler did do it

① Given

② Given

③ L. of Disjunctive Inference

④ Given

⑤ L. of Contrapositive Inf.

⑥ Given

⑦ L. of Detachment

②  $U \rightarrow \sim S \checkmark$

$\sim U \rightarrow \sim R \checkmark$

$S \vee H$

$R \checkmark$

$\therefore H$

$\left. \begin{array}{l} \textcircled{1} \sim U \rightarrow \sim R \\ \textcircled{2} R \end{array} \right\} \rightarrow \textcircled{3} U$   
 $\left. \begin{array}{l} \textcircled{3} U \\ \textcircled{4} U \rightarrow \sim S \end{array} \right\} \rightarrow \textcircled{5} \sim S$   
 $\left. \begin{array}{l} \textcircled{5} \sim S \\ \textcircled{6} S \vee H \end{array} \right\} \rightarrow \textcircled{7} H$

James did arrive on time.

① Given

② Given

③ L. of Contrapositive Inf.

④ Given

⑤ L. of Detachment

⑥ Given

⑦ L. of Disjunctive Inf.

③  $L \vee O$

$O \rightarrow S \checkmark$

$S \rightarrow \sim T \checkmark$

$T \checkmark$

$\therefore L$

$\left. \begin{array}{l} \textcircled{1} S \rightarrow \sim T \\ \textcircled{2} T \end{array} \right\} \rightarrow \textcircled{3} \sim S$   
 $\left. \begin{array}{l} \textcircled{3} \sim S \\ \textcircled{4} O \rightarrow S \end{array} \right\} \rightarrow \textcircled{5} \sim O$   
 $\left. \begin{array}{l} \textcircled{5} \sim O \\ \textcircled{6} L \vee O \end{array} \right\} \rightarrow \textcircled{7} L$

I did the geometry question.

① Given

② Given

③ L. of Contrapositive Inf.

④ Given

⑤ L. of Contrapos. Inf.

⑥ Given

⑦ L. of Disjunctive Inf.

$$\begin{array}{l}
 \textcircled{4} \quad W \wedge A \\
 A \rightarrow R \\
 (M \wedge N) \rightarrow \sim R \\
 \hline
 \therefore \sim M
 \end{array}$$

$$\begin{array}{l}
 \textcircled{1} \quad W \wedge A \rightarrow \textcircled{2} A \\
 \textcircled{3} \quad A \rightarrow R \quad \left. \vphantom{\textcircled{1}} \right\} \rightarrow \textcircled{4} R \\
 \textcircled{5} \quad (M \wedge N) \rightarrow \sim R \quad \left. \vphantom{\textcircled{1}} \right\} \rightarrow \textcircled{6} \sim(M \wedge N) \\
 \textcircled{7} \quad \sim M \vee \sim N \\
 \textcircled{8} \quad W \quad \left. \vphantom{\textcircled{1}} \right\} \rightarrow \textcircled{9} \sim M
 \end{array}$$

I have shown that I will not wear shorts.

- |  |   |   |
|--|---|---|
| $\textcircled{1}$ Given                | $\textcircled{5}$ Given                     | $\textcircled{9}$ Disjunctive Inference |
| $\textcircled{2}$ L. of Simplification | $\textcircled{6}$ L. of Contrapositive Inf. |   |
| $\textcircled{3}$ Given                | $\textcircled{7}$ De Morgan's Law           |   |
| $\textcircled{4}$ L. of Detachment     | $\textcircled{8}$ L. of Simplification      |   |

$$\begin{array}{l}
 \textcircled{5} \quad D \wedge (A \vee N) \vee \\
 A \rightarrow C \quad \checkmark \\
 (D \wedge E) \rightarrow \sim C \\
 \sim N \quad \checkmark \\
 \hline
 \therefore \sim E
 \end{array}$$

$$\begin{array}{l}
 \textcircled{1} \quad D \wedge (A \vee N) \rightarrow \textcircled{2} A \vee N \\
 \textcircled{3} \quad \sim N \quad \left. \vphantom{\textcircled{1}} \right\} \rightarrow \textcircled{4} A \\
 \textcircled{5} \quad A \rightarrow C \quad \left. \vphantom{\textcircled{1}} \right\} \rightarrow \textcircled{6} C \\
 \textcircled{7} \quad (D \wedge E) \rightarrow \sim C \\
 \textcircled{8} \quad \sim(D \wedge E) \rightarrow \textcircled{9} \sim D \vee \sim E \\
 \textcircled{10} \quad D
 \end{array}$$

- |  |   |   |
|--|---|---|
| $\textcircled{1}$ Given                  | $\textcircled{6}$ L. of Detachment          | $\textcircled{11}$ $\sim E$               |
| $\textcircled{2}$ L. of Simplification   | $\textcircled{7}$ Given                     |   |
| $\textcircled{3}$ Given                  | $\textcircled{8}$ L. of Contrapositive Inf. |   |
| $\textcircled{4}$ L. of Disjunctive Inf. | $\textcircled{9}$ De Morgan's Law           | $\textcircled{10}$ L. of Disjunctive Inf. |
| $\textcircled{5}$ Given                  | $\textcircled{10}$ L. of Simplification     |   |

$$\begin{array}{l}
 \textcircled{6} \quad P \rightarrow L \quad \checkmark \\
 A \quad \checkmark \\
 \sim(Y \wedge \sim P) \quad \checkmark \\
 L \rightarrow \sim A \quad \checkmark \\
 \sim Y \rightarrow S \\
 \hline
 \therefore S
 \end{array}$$

$$\begin{array}{l}
 \textcircled{1} \quad L \rightarrow \sim A \quad \left. \vphantom{\textcircled{1}} \right\} \rightarrow \textcircled{2} \sim L \\
 \textcircled{3} \quad A \quad \left. \vphantom{\textcircled{1}} \right\} \rightarrow \textcircled{4} P \rightarrow L \\
 \textcircled{5} \quad \sim P \\
 \textcircled{6} \quad \sim(Y \wedge \sim P) \rightarrow \textcircled{7} \sim Y \vee P \\
 \textcircled{8} \quad \sim Y \\
 \textcircled{9} \quad \sim Y \rightarrow S \quad \left. \vphantom{\textcircled{1}} \right\} \rightarrow \textcircled{10} S
 \end{array}$$