Give the translation that best captures the meaning of the sentence.

J = “I was joking about finding my keys.”
K = “I was joking about not finding my keys.”
F = “I found my keys.”

“I wasn’t joking about not finding my keys.”
~K

“I was joking about not finding my keys; I found them.”
K & F

“I didn’t find my keys, but I wasn’t joking about not finding them.”
~F & ~K

“I was joking about not finding my keys, but I had in fact found them.”
K & F

“I didn’t find my keys, yet neither did I joke about finding them.”
~F & ~J

W = “Wendy likes rats.”
Y = “Wendy likes mice.”
R = “Melanie likes rats.”
M = “Melanie likes mice.”

“Wendy doesn’t like rats, but mice.”
~W & Y

“It’s not so that Wendy likes rats and mice.”
~(W & Y)

“Unlike Wendy, Melanie does like rats.”
~W & R

“Melanie doesn’t like rats and doesn’t like mice either.”
~R & ~M

“Both Wendy and Melanie like rats but not mice.”
(W & R) & (~Y & ~M)  These can be in any order.

K = “Keith is excited about the vacation.”
C = “Chris is excited about the vacation.”
M = “Keith is moping.”
Logic—Sentential Translation Practice 4 with Answers (Negation and Conjunction)

P = “Chris is moping.”

“He is unexcited about the vacation, but not Chris.”
~K & ~C

“Rather than being excited about the vacation, Chris is moping.”
~C & P

“Chris and Keith are not both moping; Keith is excited about the vacation!”
~(P & M) & K

“Chris is unexcited about the vacation; however, Keith is excited about it.”
~C & K

“Chris and Keith are the same with respect to whether they are excited about the vacation.”
~(C & ~K) & ~(~C & K)

C= “He did score a goal.”
K= “He did skate well.”
H= “He was hit from behind.”
F= “The fans liked it.”

He was hit from behind and the fans did not like it, but he was not unable to score a goal.
(H & ~F) & ~C

He did not skate well, and the fans did not like it.
~K & ~F

He did not skate well, but he scored a goal.
~K & C

He did skate well, yet he did not score a goal.
K & ~C

He did not skate well, yet he scored a goal and the fans liked it.
~K & (C & F)

The fans liked it, even though he was hit from behind.
F & H

H= “The home team won.”
A= “The away team won.”
M= “The home team scored.”
Logic—Sentential Translation Practice 4 with Answers (Negation and Conjunction)

W = “The away team scored.”

Both the away team and the home team scored, but the away team won.
(W & M) & A

The home team did not win; they did not score.
~H & ~M

Both the home team and the away team were unable to win.
(~H & ~A)

No team scored, and no team won.
(~M & ~W) & (~H & ~A)

The home team scored; nevertheless, the away team won.
M & A

The away team scored and won the game; the home team did not even score.
(W & A) & ~M

It is false that the home team did not score, but they did not win.
~(~M & ~H)

J = “John read the book.”
H = “Henry read the book.”
O = “John passed his test.”
E = “Henry passed his test.”
X = “John studied.”
Y = “Henry studied.”

Both John and Henry read the book, but neither of them passed the test.
(J & H) & (~O & ~E)

John read the book and Henry did not, yet Henry passed the test and John did not.
(J & ~H) & (E & ~O)

Both Henry and John studied, and both read the book.
(X & Y) & (J & H)

John didn’t pass the test, however he studied and read the book.
~O & (X & J)

John did not study and did not read the book, but Henry both studied and read the book.
(~X & ~J) & (Y & H)
It’s not so that Henry failed the test, but he did not both study and read.
\( \sim E \land \sim (Y \land H) \)

\text{M = Mort sailed to Italy.}  
\text{N = Natasha sailed to Italy.}  
\text{S = Syd sailed to Italy.}  
\text{T = Theresa sailed to Italy.}  

\text{O = Mort flew to France.}  
\text{P = Natasha flew to France.}  
\text{U = Syd flew to France.}  
\text{W = Theresa flew to France.}  

\text{Q = Mort took the train to Miami.}  
\text{R = Natasha took the train to Miami.}  
\text{X = Syd took the train to Miami.}  
\text{Y = Theresa took the train to Miami.}  

1. Mort and Natasha took the train to Miami; then Natasha sailed to Italy, but Mort flew to France.
\( (Q \land R) \land (N \land O) \)

2. Although Syd sailed to Italy, Theresa did not.
\( (S \land \sim T) \)

3. Syd, Natasha, and Theresa flew to France while Mort took the train to Miami.
\( (P \land U) \land (W \land Q) \)

4. Theresa and Natasha did not take the train to Miami, although both flew to France.
\( (\sim Y \land \sim R) \land (W \land P) \)

5. Mort and Natasha took the train to Miami, but neither sailed to Italy.
\( (Q \land R) \land (\sim M \land \sim N) \)

6. Although Syd took the train to Miami, both Theresa and Natasha avoided taking it.
\( (X \land (\sim Y \land \sim R)) \)

7. Although Mort took the train to Miami, he did not sail to Italy; rather, he flew to France.
\( (Q \land (\sim M \land O)) \)

9. Mort, Natasha, Syd and Theresa did not all take the train to Miami.
\( \sim((Q \land R) \land (X \land Y)) \)
F = “Fred saw the ghost.”
X = “Velma saw the ghost.”
D = “Daphne saw the ghost.”
S = “Scooby saw the ghost.”
Y = “Fred stopped the ghost from escaping.”
Z = “Velma stopped the ghost from escaping.”
A = “Daphne stopped the ghost from escaping.”
G = “Scooby stopped the ghost from escaping.”

Sample sentence: “Velma stopped the ghost from escaping; Scooby did too.”
Example of a correct translation: Z & G

1. Fred, Velma and Scooby saw the ghost.
F & (X & S)

2. Velma and Fred both did not stop the ghost from escaping.
~Z & ~Y

3. Scooby didn’t see the ghost, but stopped it from escaping anyway.
~S & G

4. For sure, Scooby didn’t see the ghost, but it’s untrue that Daphne did not see the ghost.
~S & ~~D

5. Daphne and Velma did not both see the ghost.
~(D & X)

6. Velma saw the ghost, yet she didn’t stop it from escaping.
X & ~Z

7. Fred did not see the ghost, but Velma and Scooby both did.
~F & (X & S)

8. It is incorrect that Daphne and Velma both stopped the ghost from escaping.
~(A & Z)

9. Scooby and Fred saw the ghost, but it was Daphne who stopped the ghost from escaping.
(S & F) & A