Problem: James knows that half of the students from his school are accepted at the public university nearby. Also half are accepted at the local private college. James thinks that these figures add up to 100 percent, so he will surely be accepted at one or the other institution. Explain why James may be wrong. If possible use a diagram in your explanation.

4 points: Exemplary response
All of the following characteristics must be present.
The answer is correct.
The explanation is clear and complete.
The explanation includes a mathematically correct reason for the faulty reasoning involving the assumption of the disjoint sets in the problem.
Some sort of diagram is provided that relates directly and correctly to the information in the problem.

3 points: Good response
Exactly one of the following characteristics is present.
The answer is incorrect.
The explanation lacks clarity.
The explanation is incomplete.
No diagram is provided that relates directly and correctly to the information in the problem.

2 points: Inadequate response
All of the following characteristics must be present.
The answer is incorrect.
The explanation lacks clarity or is incomplete but does indicate some correct and relevant reasoning.
No diagram is provided that relates directly and correctly to the information in the problem.

1 point: Poor response
All of the following characteristics must be present.
The answer is incorrect.
The explanation, if any, uses irrelevant arguments (e.g., whether a student is qualified for college, whether a student has applied for college).
No solution is attempted beyond just copying data given in the problem statement.
No diagram is provided that relates directly and correctly to the information in the problem.