Exploration Story Problems: Possible Student Responses

# Option 1: Addition

Your bedroom door is open 66 degrees. To get your new bed inside, you need it to be open an additional 31 degrees. To get your new dresser in, you need it to be open another 24 degrees beyond what you need for the bed. How wide, in degrees, does your door need to be open in order to get both your bed and your dresser in your room?

### Possible Student Responses

* 31 degrees + 66 degrees = 97 degrees: Incorrect. The student has not included all of the numerical information. The question asks, "How wide, in degrees, does your door need to be open in order to get both your bed and your dresser in your room?"
* 66 degrees + 24 degrees = 90 degrees: Incorrect. The problem states that "To get your new dresser in, you need it to open an additional 24 degrees." This additional 24 degrees is to be added to the 97 degrees to which the door is already open.
* 24 degrees + 31 degrees = 55 degrees: Incorrect. This answer ignores the 66 degrees to which the door is already opened.
* 66 degrees + 24 degrees + 31 degrees = 121 degrees: Correct. The question is asking how far the door needs to open in total (in degrees) for both items to get through.

# Option 2: Subtraction with Extra Information

Your bedroom door is open 66 degrees, but in order to get your new bed inside you need it to be open to 99 degrees. To get your new dresser in, you need it to be open to 127 degrees. How much farther do you need to open your door to get your new bed and dresser inside?

### Possible Student Responses

* 127 degrees - 99 degrees = 28 degrees: Incorrect. This solution is finding the difference between the amount the door must open to get the dresser in and the amount the door must open to get the bed in.
* 127 degrees - 66 degrees = 61 degrees: Incorrect. The question asks, "How much farther will you need to open your door to get your new bed and dresser inside?" This response looks only at how much farther the door must open to get the dresser inside.
* 99 degrees - 66 degrees = 33 degrees: Incorrect. This answer addresses only how much farther the door should open to get the bed inside the room, and, therefore, is incomplete.
* 99 degrees - 66 degrees = 33 degrees and 127 degrees - 66 degrees = 61 degrees: Correct. The student has addressed both parts of the two-part question. Make sure students label which amount is for the bed and which is for the dresser.

# Option 3: Subtraction with a Missing Variable

Your bedroom door is open 66 degrees, but in order to get your new bed inside you need it to be open to 99 degrees. To get your new dresser in, you need it to be open to 127 degrees. How much farther will you need to open your door for it to make a straight angle? (Note: This question has extra variables included within it, making it more challenging. In order to solve the problem, students must already know that a straight angle is 180 degrees.)

### Possible Student Responses

* 127 degrees - 99 degrees = 28 degrees: Incorrect. This answer finds the difference between the amount the door must open to get the dresser in and the amount the door must open to get the bed in, and not how much farther you need to open the door for it to make a straight angle.
* 127 degrees - 66 degrees = 61 degrees: Incorrect. This answer finds the difference between the amount the door must open to get the dresser in and the amount the door is open, and not how much farther you need to open the door for it to make a straight angle.
* 99 degrees - 66 degrees = 33 degrees: Incorrect. This answer finds the additional number of degrees the door must open to get the bed in the room, and not how much farther you need to open the door for it to make a straight angle.
* 99 degrees - 66 degrees = 33 degrees and 127 degrees - 66 degrees = 61 degrees: Incorrect. This answer determines the values listed in the two prior scenarios, and not how much farther you need to open the door for it to make a straight angle.
* 180 degrees - 99 degrees = 81 degrees: Incorrect. The problem asks how much farther you need to open the door for it to make a straight angle. It is not necessary to subtract the number of degrees that the door must open to get the bed in.
* 180 degrees - 127 degrees = 53 degrees: Incorrect. The problem asks how much farther you need to open the door for it to make a straight angle. It is not necessary to subtract the number of degrees that the door must open to get the bed and dresser in.
* 180 degrees - 66 degrees = 114 degrees: Correct. The door is already open 66 degrees. The problem asks how much farther you need to open the door for it to make a straight angle. The number of degrees required to get the bed in and to get the dresser in are irrelevant.