Light Exam Questions

Figure 1 shows the apparatus a student used to investigate the reflection of light by a plane mirror.

The student drew four ray diagrams for each angle of incidence.

The student measured the angle of reflection from each diagram.

Table 1 gives the student's results.

Figure 1

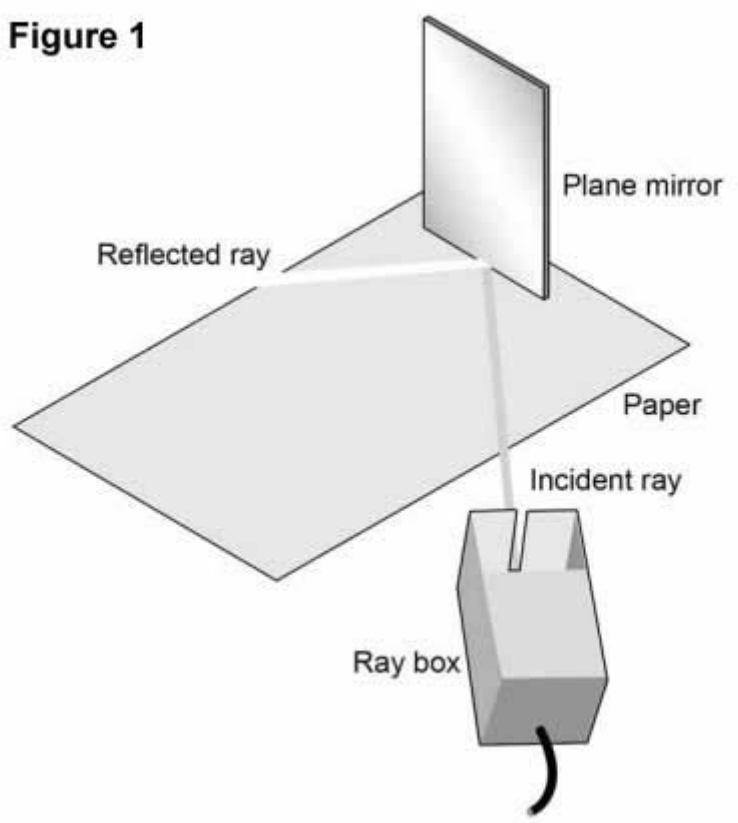

Table 1

	Angle of reflection			
Angle of incidence	**Test 1**	**Test 2**	**Test 3**	**Test 4**
20°	19°	22°	20°	19°
30°	31°	28°	32°	30°
40°	42°	40°	43°	41°
50°	56°	49°	53°	46°

1. For each angle of incidence, the angle of reflection has a range of values.

   This is caused by an error.

   What type of error will have caused each angle of reflection to have a range of values?

   [1 mark]

2. Suggest what the student may have done during the investigation to cause each angle of reflection to have a range of values.

   [1 mark]

3. Estimate the uncertainty in the angle of reflection when the angle of incidence is 50˚.

   Show how you determine your estimate.

   [2 marks]

   Uncertainty = ± _____˚

4. The student concluded that for a plane mirror, the angle of incidence is equal to the angle of reflection.

   Explain whether you agree with this conclusion.

   Use examples from the results in **Table 1** in your answer.

   [2 marks]

5. What extra evidence could be collected to support the student's conclusion?

[1 mark]

6. State **one** change the student should make to the apparatus if he wants to use the same method to investigate diffuse reflection.

[1 mark]

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