

CCT Weekly Practice (Science)

Unit-MIRROR O' MIRROR

Regular mirrors are actually plane mirrors i.e. a mirror without an inward or outward curve. These mirrors can be found almost anywhere – from bathrooms to hallways to building exteriors. Plane mirrors create upright, virtual, laterally inverted images of the same size as the object and at the same distance as the objects. The ratio of the size of the image to the size of the object is termed as the 'magnification'.

Question 1:-

A plane mirror produces a magnification of:

- i) 2
- ii) 3
- iii) 1
- iv) 4

Question 2:-

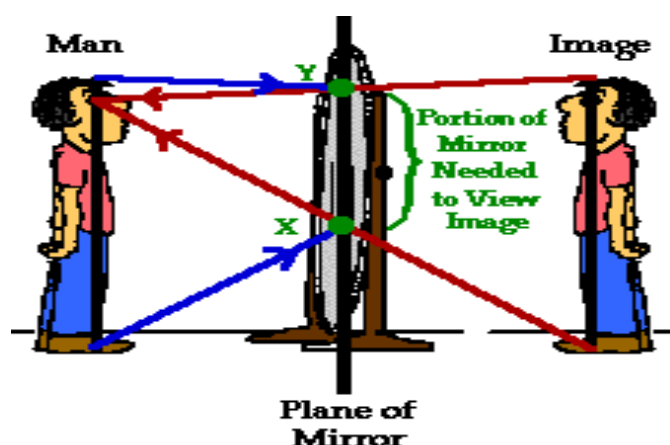
If a person of height 1.45 m stands in front of a plane mirror, he/she would get an image as high as:

- i) 1450 cm
- ii) 1450 mm
- iii) 145 mm
- iv) 14.5 cm

Question 3:-

A car is parked at the roadside. A truck passes by it, at a speed of 5m/s. What would be the speed at which the image of the car appears to move away from the truck, as viewed in the rear-view mirror of the truck?

- i) 1 m/s
- ii) 2.5 m/s
- iii) 5 m/s
- iv) 10 m/s

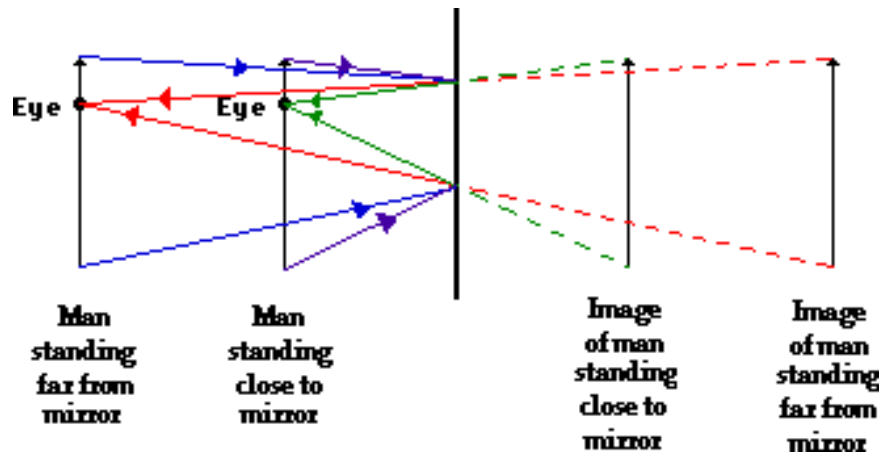


The diagram depicts some important information about plane mirrors. The man is twice as tall as the distance between points X and Y. In other words, to view an image of yourself in a plane mirror, you will need a mirror, which is equal to half of your height.

Rohit is 6-feet tall. He is the tallest person in his family of four. His father, mother and younger sister are 5.5-feet, 5-feet and 4-feet tall respectively. Rohit convinced his parents that it would be a waste of money to buy a mirror longer than 3 feet. Rohit justified, "I'm the tallest person in the family and only 3 feet high mirror would be sufficient to view my image, according to 2:1 principle." Rohit's parents conceded and they purchased a 3-feet high mirror and mounted it on the bathroom wall.

Question 4:-

Would all members be able to see their full image? Support your answer with a reason.



Question 5:-

All members tried to view themselves in the mirror from different distances. Considering the image above, state if it would help them or not.

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Answer Key:-

Ans: 1 – option (iii)

Ans: 2 – option (ii)

Ans: 3 – option (iv)

Speed of image in the mirror is twice the original speed. Therefore, the speed at which the car appears to move away in the rear view mirror of truck i.e.

$$\text{Speed} = 2 \times 5 = 10\text{m/s}$$

Ans: 4 – No, the 3-feet mirror can be mounted in the perfect position for Rohit to view his entire image. But, for rest of the family members, the position of the eyeball is lower than Rohit's, which would make a difference in the size of the mirror for them.

Ans: 5 – No. As we can see from the diagram that even by changing the position of the object in front of the mirror, the point of reflection of light from the mirror remains same or we can say that their line of sight crosses the mirror at same location from whatever position they chose in front of the mirror. Hence they will not be able to see their full image from any position.