

Answer on Question #55520-Physics-Optics

Why images formed by an object placed between two plane mirrors whose reflecting surfaces make an angle of 90° with one another lies on a circle?

Answer

The object and all its (virtual) images lie equidistant from each other on a circle whose center is the line between the two mirrors, in a plane perpendicular to that line. (This circle, of course, extends behind the mirrors.)

The basis for the operation of this demonstration is that a mirror reflects light from it at the same angle in the opposite direction to its original path. That is, the angle of reflection equals the angle of incidence, where both angles are with reference to the normal to the mirror. For a light ray perpendicular to the mirror's surface, the angle of incidence equals zero, as does the angle of reflection, and the ray is reflected back on itself. For any nonzero angle of incidence, the light ray emerges at the same angle on the opposite side of the normal.

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