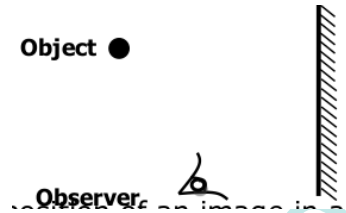
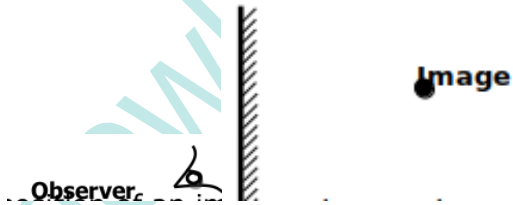
7. RECTILINEAR PROPAGATION OF LIGHT

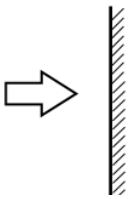
1. State the property of light associated with formation of shadows.
2. Distinguish between real and virtual images.
3. An electric filament lamp used to light a room is replaced by a long fluorescent tube. State the effect this will have on the shadow formed by object in the room.
4. A man stands infront of a large plane mirror. If the distance between him and the plane mirror is **5 m**. What is the distance between him and his image.
5. Explain why the image of an object formed by a plane mirror is called a virtual image.
6. A white paper is a good reflector of light but does not form an image like a mirror. Explain this observation.
5. A lady standing in front a mirror sees an upright image, that is of the same size as herself. State with a reason the type of the mirror she was using.
6. State the number of images formed when an object is between two plane mirrors placed parallel to each other.
7. 11 images are formed when two mirrors are inclined at an angle between them. Determine the angle.
8. Two mirrors are inclining at $\mathbf{60^0}$ to each other. Determine the number of images observed and state one application of this arrangement.
9. An object is placed near a plane mirror as shown in below. Using two rays complete the diagram showing the position of the image as seen by the observer.



10. Fig shows the position of an image in a plane mirror. E represents the eye of an observer. Complete the diagram to locate the position of the object.

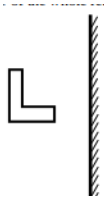


11. The figure below shows an object placed in front of a plane mirror.



Sketch the image of the object as seen in the mirror.

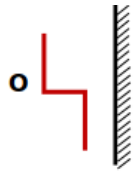
12. The diagram below, draw the image of the whole letter **L** Sketch the image of the Object as seen in the mirror.



13. The figure below shows an object **O** placed in front of a plane mirror.

Sketch the image of the object as seen in the mirror.

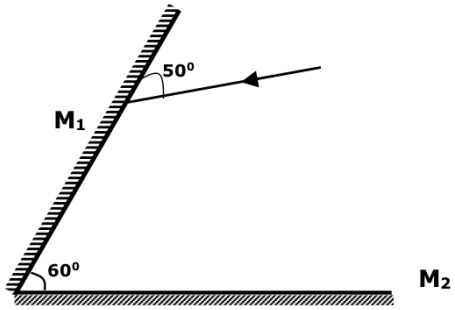
14. The figure below shows an object **O** placed in front of a plane mirror.
Sketch the image of the object as seen in the mirror.



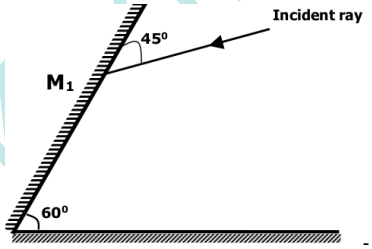
15. Figure below shows two mirrors $\mathbf{M_1}$ and $\mathbf{M_2}$ placed at an angle of **60 º** to each other. A ray of light is incident on mirror $\mathbf{M_1}$ as shown.

On the same diagram complete the ray diagram to show how it travels after striking the two mirrors and find the angle of reflection on each surface.

17. Two mirrors are placed as shown below. A ray of light is incident on mirror $\mathbf{M_1}$ as shown. Complete the ray diagram and find the angle of reflection on each surface.

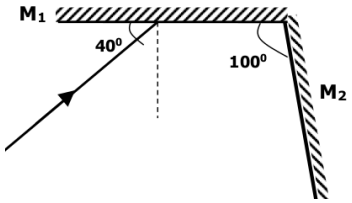


18. Figure below shows a ray of light incident on a mirror at an angle of **45 º**. Another mirror is placed at an angle of **60 º** to the first one as shown.

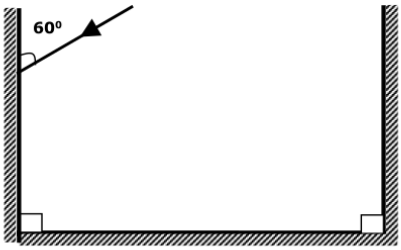


i) Sketch the path of the ray until it emerges, indicating all the angles.
ii) Calculate the number of images formed when an object is placed between the two mirrors.

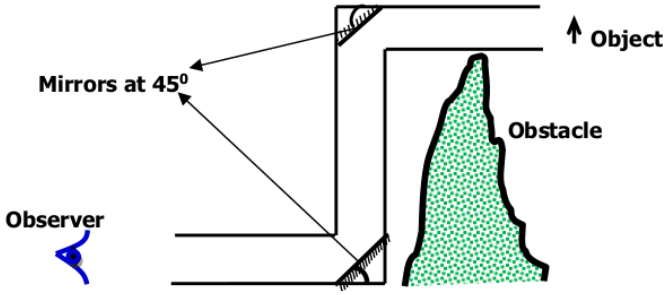
19. A ray of light is reflected as shown below. Complete the diagram and determine the angle of reflection on mirror $\mathbf{M_1}$ and $\mathbf{M_2}$.



20. Three mirrors are placed at right angles as shown below. A ray of light is incident on one of the mirror. Complete the ray diagram and find the angle of reflection on each surface.

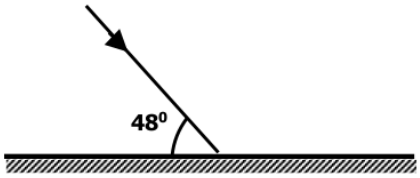


21. What is the name of the apparatus shown in the diagram below?



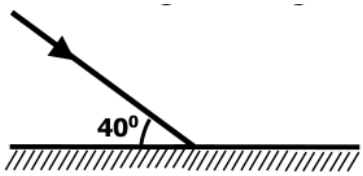
(i) Name of instrument.
(ii) State ONE application of the instrument shown above.
(iii) Complete the ray diagram to show to the final image position.

22. Figure below shows a ray of light being incident on a mirror.



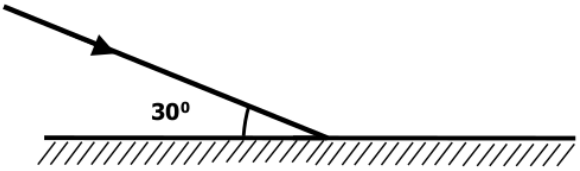
What is the angle of reflection?

23. A ray of light makes an angle of **40⁰** with a plane mirror as shown below. The mirror is then rotated through an angle of **15⁰** in a clockwise direction.



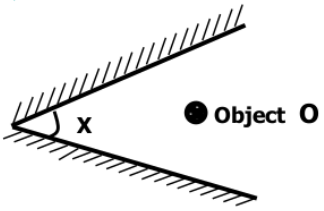
Determine
(i) The angle of rotation of the reflected ray.
(ii) The angle between the incident ray and the new reflected ray.

24. The diagram shows a ray of light incident on a plane mirror. The mirror is rotated **anticlockwise** through an angle of **10⁰**

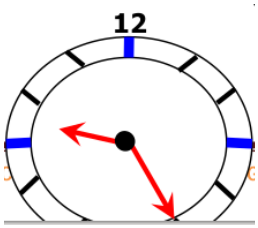


Determine
(i) The angle through which the reflected ray rotated.
(ii) The angle between the incident ray and the new reflected ray.

25. The figure below shows two plane mirrors inclined at an angle x from each other. A viewer counts a total of seven images from looking directly from the object O. Determine value of x.



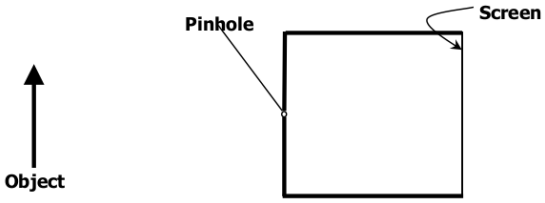
26. The diagram shows the image of a watch face in a plane mirror



What is the time shown on the watch face?

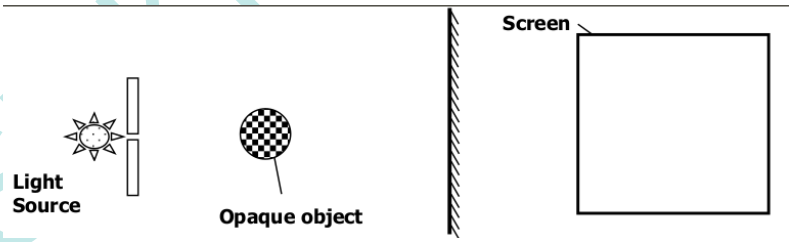
PINHOLE CAMERA

1. When the hole on a pinhole camera is made larger the image formed becomes larger. State one other change on the image formed.
2. State t**wo** conditions under which a pinhole camera may form an image on its screen which has the same size as the object.
3. State two differences between images formed by pinhole camera and a plane mirror.
4. State the effect on the image in a pinhole camera when the length of the camera is reduced and the object distance is fixed.
5. What is the effect of moving a pinhole camera closer to the object?
6. Explain why the inner part of a pinhole camera is painted black.
7. State the characteristics of images formed by a pinhole camera.
8. State **one** disadvantage of using a pin-hole camera to take photographs.
9. What is the effects on the image when the camera is elongated?
10. State any 2 ways of in increasing the size of an image formed by a fixed pinhole camera.
11. Explain why enlarging the pinhole of the pinhole camera causes the image to be blurred.
12. State two factors that determine the kind of image formed by a pinhole camera.
13. State one disadvantage of using a pin hole camera to take photographs
14. In the space provided below, sketch a labeled diagram to show how a pinhole camera forms an image of a vertical object placed in front of the pinhole.
15. A student holds a disc of diameter **100 mm**. It just blocks the sun when held at a distance of **1m** from the eye. If the distance from sun to the disc **is 1.5 x 10^8 km**, determine the diameter of the sun.
16. A building standing 100 m from a pinhole camera produces on the screen of the camera an image **5 cm** high **10 cm** behind the pinhole.
    Determine the actual height of the building.
17. A pinhole camera forms an image of size **10 cm**. The object is **5 m** tall and **20 m** away from the pinhole. Find the length of the pinhole camera.
18. The figure below shows an object placed infront of a pinhole camera. Using rays, show how the image is formed on the screen.

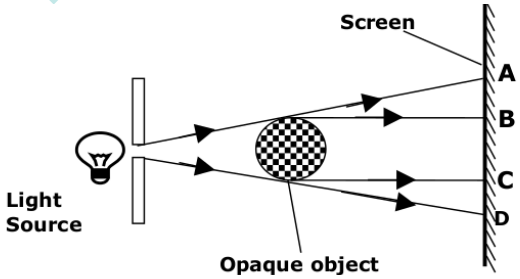


SHADOWS

1. What are the conditions necessary for the occurrence of annular eclipse?.
2. State **two** factors affecting the type of shadow formed by an object placed infront of a source of light.
3. Describe how a solar eclipse occurs using a well labeled diagram.
4. Light from a point source falls on an object. Draw rays to show how the shadow of the object is formed on the screen and name the shadows.



5. The figure shows three point sources of light with an opaque object placed between them and the screen.



State and explain the nature of shadow formed along BC.

6. When the moon comes between the sun and the earth in a straight line, an eclipse occurs. Name the eclipse.
7. Draw a ray diagram to show the formation of a partially dark shadow and a totally dark shadow during the eclipse of the sun.