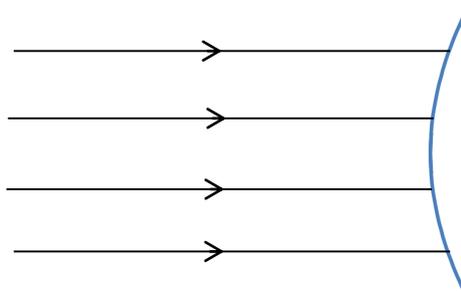


Shedding Light on Curved Mirrors Name: _____

1. Write down the two types of curved mirrors. _____ and _____

Part B: Convex Mirrors

2. On the diagram below, sketch the path the reflected light rays will take after they strike the convex mirror.



3. Compare and contrast the images produced by flat mirrors and convex mirrors.

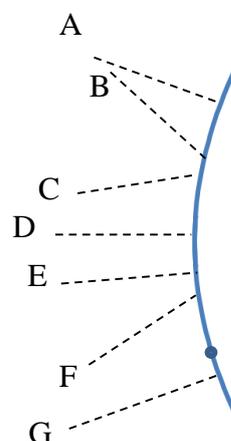
4. Describe what a “field of view” means. How does a convex mirror’s field of view compare to a flat mirror’s field of view?

5. Describe one place you might find a convex mirror and explain what the mirror is used for.

6. To accurately draw ray diagrams, we need to know how a light ray will reflect, but a “normal line” has to be drawn first. A normal line is a line at right angles to the surface of the mirror.

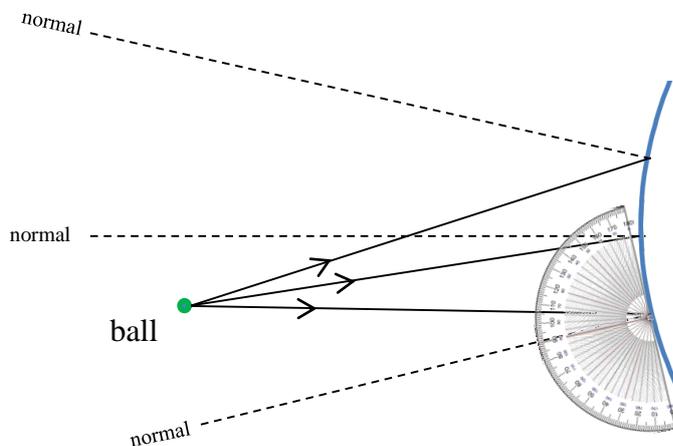
(a) Which of the dotted lines in the diagram are at right angles (or 90°) to the mirror? (there isn't just one)

(b) Draw a normal line from the dot on the mirror (between lines F and G).

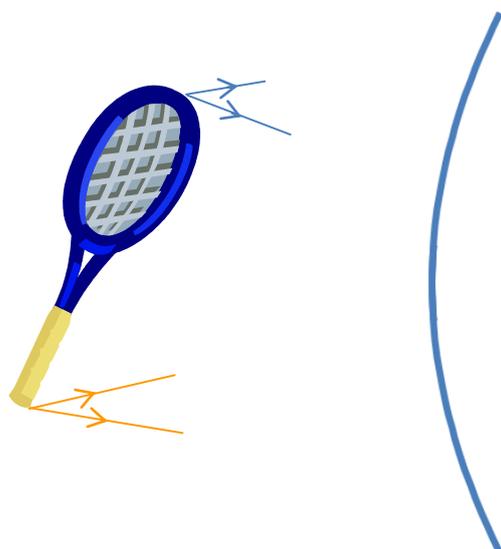


SKILL-BUILDING EXERCISES

7. Using a **protractor**, **complete the path** of the three light rays (shown as solid lines in the diagram below) after they hit the mirror. You will need to **measure each angle of incidence** and then **draw in the reflected rays; the angle of incidence = the angle of reflection**. **Include the angles** in the diagram. (The normal lines have been drawn for you, as has the correct position of the protractor for the third light ray.)

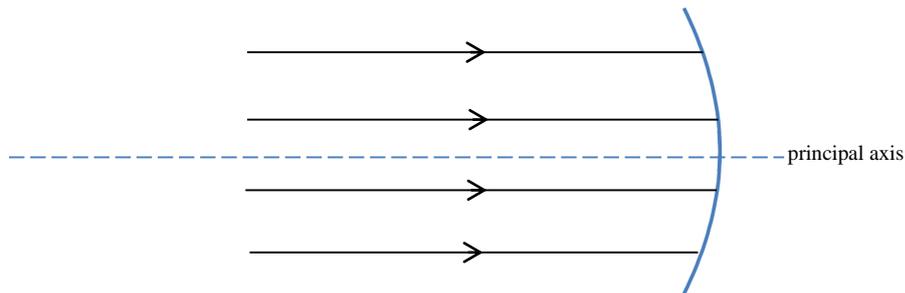


8. In the ray diagram above, **trace your reflected rays back behind the mirror** to where they meet, and then **draw in the position of the ball's image** (as it would appear in the mirror).
9. A tennis racket is in front of a convex mirror. **Complete the path of the four light paths shown** and then **draw in the position of the racket's image**.
- STEP 1. Extend the four light rays until they hit the mirror.
- STEP 2. Draw in the four normal lines at each point. (Reminder: NOT parallel to each other)
- STEP 3. Measure the angles of incidence.
- STEP 4. Draw in the reflected rays. (Remember, the angle of incidence = the angle of reflection)
- STEP 5. Trace the reflected rays back behind the mirror (using dotted lines).
- STEP 6. Draw in the racket's image.



Part C: Concave Mirrors

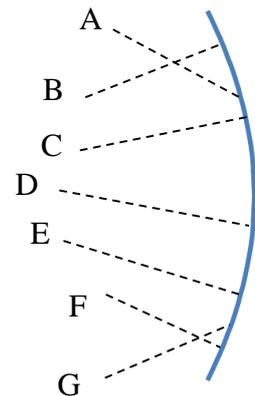
10. On the diagram below, **sketch** the path the light rays will take after they strike the **concave** mirror and reflect. **Label the focal point** and the **vertex** of the mirror.



11. If an object is fairly close to a concave mirror (closer than its focal point) describe how the image of the object will appear in the mirror.

12. Describe one place you might find a concave mirror and explain what the mirror is used for.

13. Which of the dotted lines on the right are at right angles (or 90°) to the mirror? (there isn't just one)



SKILL-BUILDING EXERCISE

14. A tennis racket is in front of a concave mirror, and is entirely within the mirror's focal point. **Complete the four light paths shown** and then **draw in the position of the racket's image**.

STEP 1. Extend the four light rays until they hit the mirror.

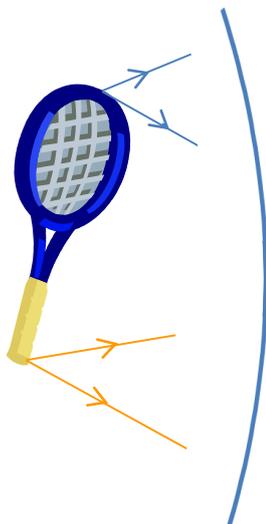
STEP 2. Draw in the four normal lines at each point.

STEP 3. Measure the angles of incidence.

STEP 4. Draw in the reflected rays. (Remember, the angle of incidence = the angle of reflection)

STEP 5. Trace the reflected rays back behind the mirror (using dotted lines).

STEP 6. Using the points where each pair of rays meet, draw in the racket's image.



15. Telescopes which use mirrors are called _____ telescopes, while telescopes which use lenses to focus the light are called _____ telescopes.
16. _____ telescopes are used by most professional astronomers because

Part D: Parabolic Concave Reflectors

17. Using a diagram and text, describe how either a satellite dish works or how a solar cooker works.

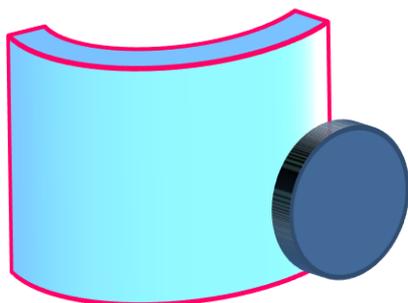
18. What does it mean for a satellite to be in a geostationary orbit?

19. Telecommunications companies and broadcasters (like TV networks) use satellite transmitters to beam signals up to satellites which then beam the signal back down to another part of the planet. Draw a labelled diagram of this information.

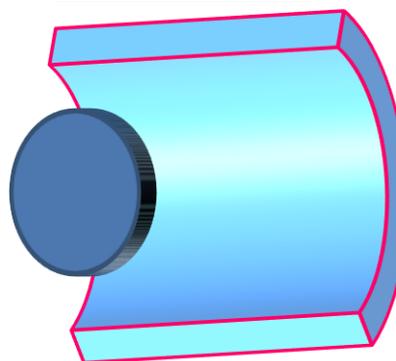
20. Using a diagram and text, describe how either a torch, or a headlight on a car, or a satellite dish antenna uses a concave reflector to produce a beam.

Part E: Linear Concave and Convex Mirrors

21. linear _____ mirror



22. linear _____ mirror



23. Draw in (on the diagrams above) how the two circular shapes will appear in each mirror. Describe the image formed in each case.