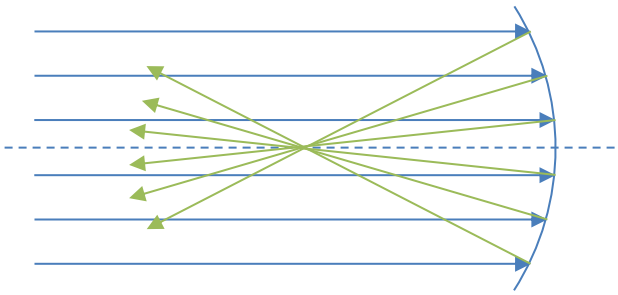
CONCEPT: RAY DIAGRAMS FOR CONCAVE MIRRORS

- You can see what happens to light reflecting off mirrors by drawing RAY DIAGRAMS
  - These are diagrams that simply follow the law of reflection to show the path of light rays

- Before we are able to draw ray diagrams, we have to define the FOCUS: the point where collimated light converges

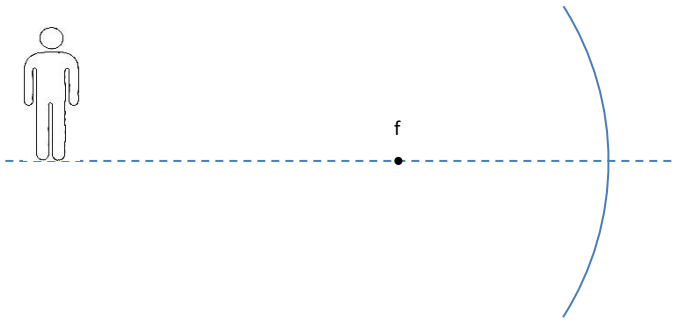


- The distance from the apex of the mirror to the focus is known as the FOCAL LENGTH

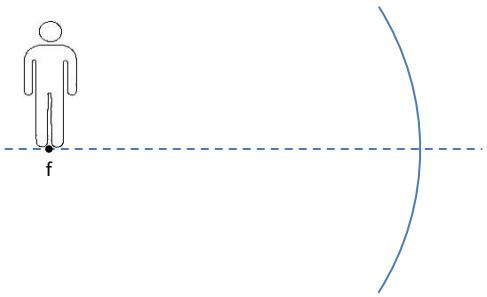
- To draw RAY DIAGRAMS FOR CONCAVE MIRRORS, draw two of the following lines:

  1) A line parallel to the central axis, then reflected off the mirror through _____
  2) A line through the focus, then reflected off the mirror _____
  3) A line to the apex of the mirror, reflecting at _____

- When light comes off an object, a mirror can form an IMAGE
  - An IMAGE is a point of convergence of light
  - In this case, the image is [UPRIGHT / INVERTED]

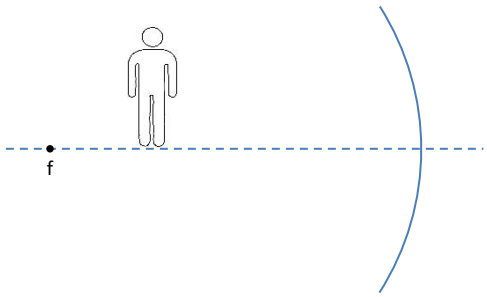


EXAMPLE: Where would the image be formed for an object at the focal point of a concave mirror?



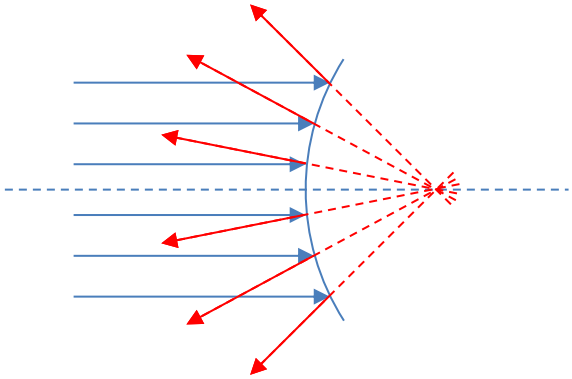
PRACTICE: IMAGE OF OBJECT INSIDE FOCUS OF CONVEX MIRROR

Will an image be formed for an object placed inside the focus of a convex mirror? If so, where will it be formed?



CONCEPT: RAY DIAGRAMS FOR CONVEX MIRRORS

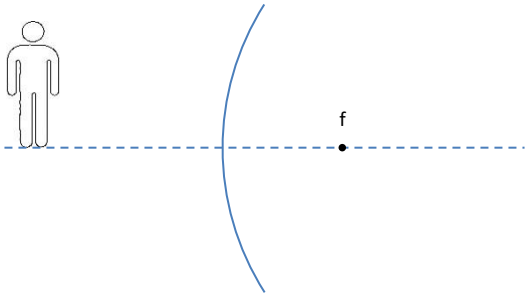
- While a concave mirror converges light, a convex mirror will _____ light
  - This means that light will _____ focus



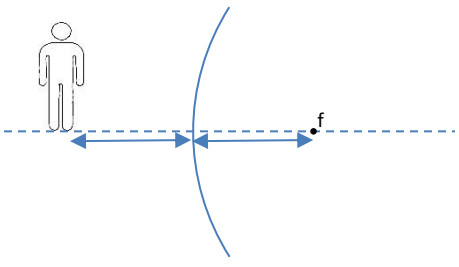
- However, light APPEARS to focus on a point, known as the APPARENT FOCUS
  - This focus, while not real, is still commonly referred to as simply the focus

- To draw RAY DIAGRAMS FOR CONVEX MIRRORS, draw two of the following lines:
  1) A line parallel to the central axis, then reflected off the mirror _____
  2) A line towards the focus, then reflected off the mirror _____
  3) A line to the apex of the mirror, reflecting at _____

- When light comes off an object, a convex mirror can also form an IMAGE
  - However, this image is not REAL – light never converges
  - The light APPEARS to converge – this is known as a VIRTUAL IMAGE
  - In this case, the image is [UPRIGHT / INVERTED]

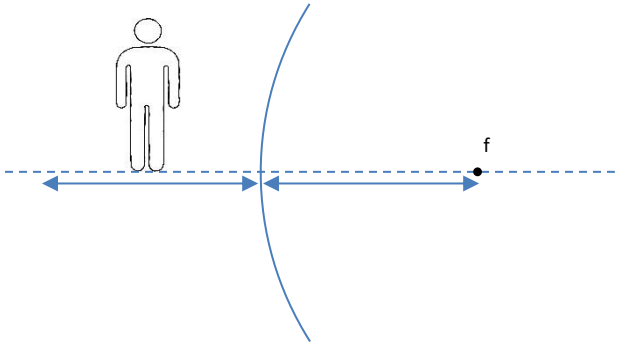


EXAMPLE: Where would the image be formed for an object a focal length away from the surface of a convex mirror?

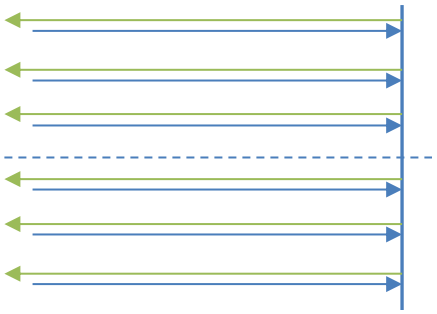


PRACTICE: IMAGE OF OBJECT INSIDE FOCUS OF CONVEX MIRROR

Find the location of the virtual image produced by a convex mirror when the object is placed a distance less than the focal length form the surface of the mirror.



CONCEPT: RAY DIAGRAMS FOR PLANE MIRRORS



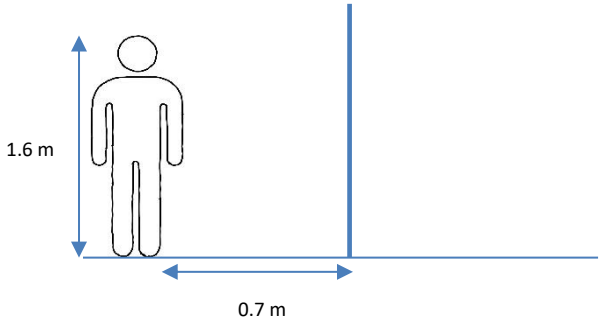
- Collimated light coming off a plane mirror neither converges nor diverges
  - Therefore there is NO focus for a plane mirror
  - Sometimes a plane mirror is said to have a focal length of _____

- To draw RAY DIAGRAMS FOR PLANE MIRRORS, draw two of the following lines:

  1) A line parallel to the central axis, then reflected off the mirror _____

  2) Any line towards the mirror, then reflected off the mirror _____

EXAMPLE: A person 1.6 m tall stands 0.7 m away from a plane mirror. How tall does the person appear in the mirror? How far from the mirror does the image appear? Is this image real or virtual?



PRACTICE: HANGING A PLANE MIRROR

You want to hang a plane mirror on your wall. If you want your entire body to fit into the mirror, what's the maximum height off the ground that the mirror must be? What is the smallest mirror you can buy? Consider yourself to be 1.55 m tall.