# Geometric Optics Cheat Sheet

Curved Mirrors
- Two types, concave(converging) and convex (diverging)
- When locating an image, you want to draw at least two rays. You can draw a ray:
    - Leaving the top of the object and running parallel the the principal axis
        - This ray will reflect back through F
    - Leaving the top of the object and running through the focus
        - This ray will reflect back parallel
    - Travelling from the centre of curvature, touching the top of the object, and striking the mirror.
        - This ray will reflect straight back through C

Remember SALT (You should have these memorized!)

Practice:
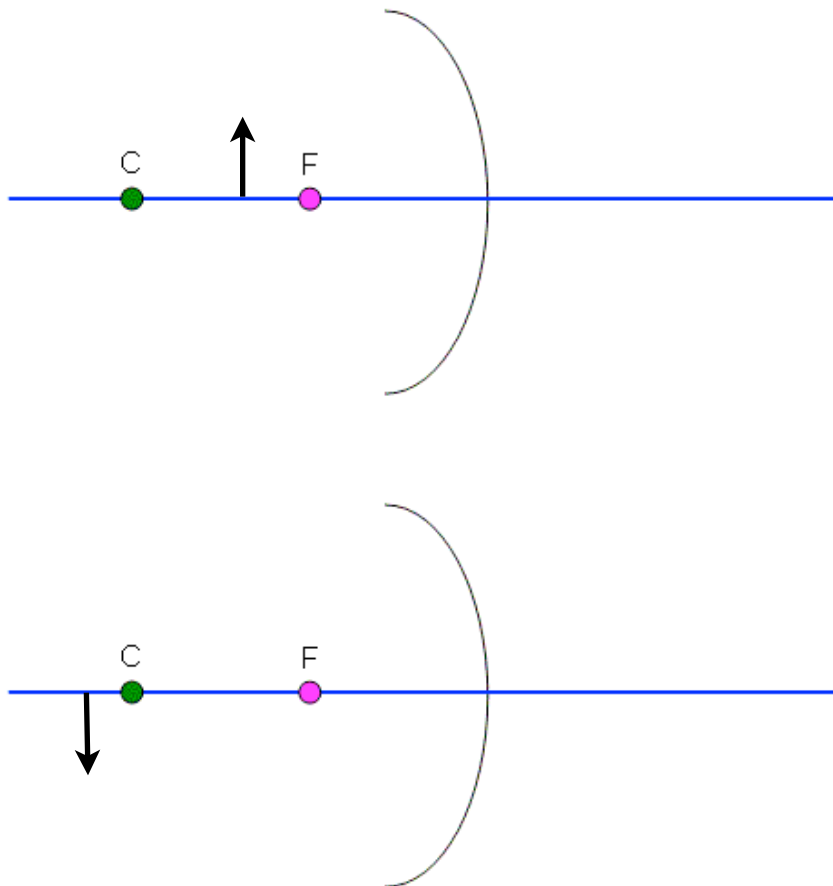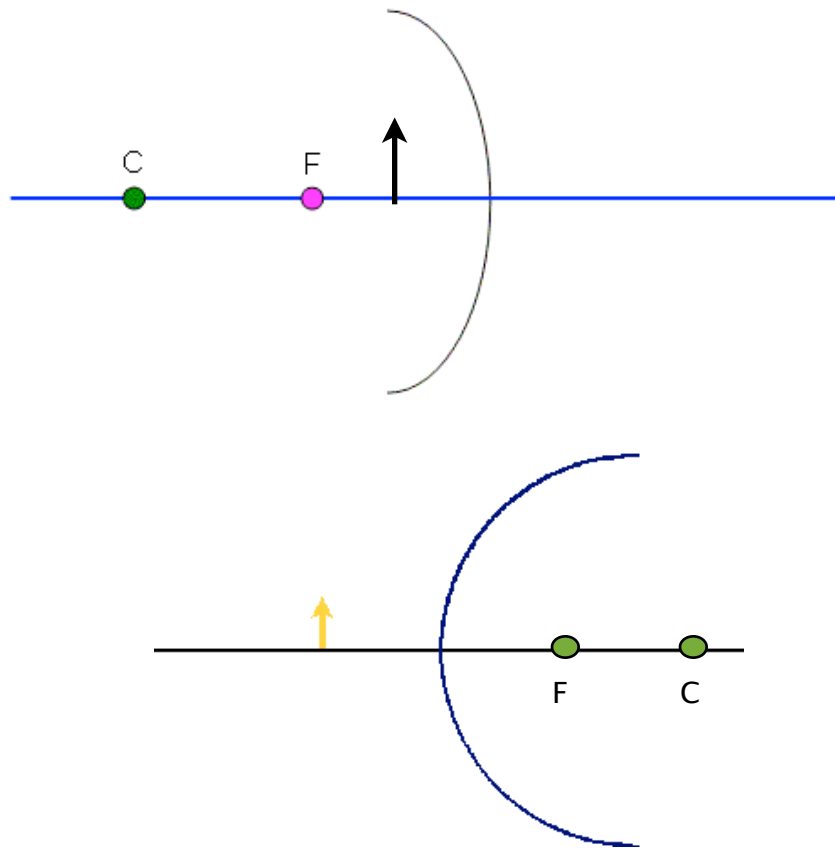
Curved Mirror Equations

1/f= 1/do + 1/di

M= hi/ho OR M=-di/do

How do I tell if an image is real or virtual?
- A real image will have a positive di, A virtual image will have a negative di

How do I tell if a mirror is concave or convex?
- A mirror with a positive focal length is concave, and object with a negative focal length is convex.

How do I determine size of object?
- If the magnification is larger than one it is larger, if it is smaller than one it is smaller.

How do I tell image is upright or inverted?
- If the magnification is positive, it is upright. If magnification is negative, it is inverted.

Example

A converging mirror has a focal length of 15 cm. An object is placed (i) 40 cm, and (ii) 10 cm from the mirror.

A candle 3.0 cm high is placed 30 cm from a converging mirror with a focal length of 20 cm. Using the mirror and magnification equations, determine the image position and its height. From these results, provide the image characteristics (S.A.L.T.)
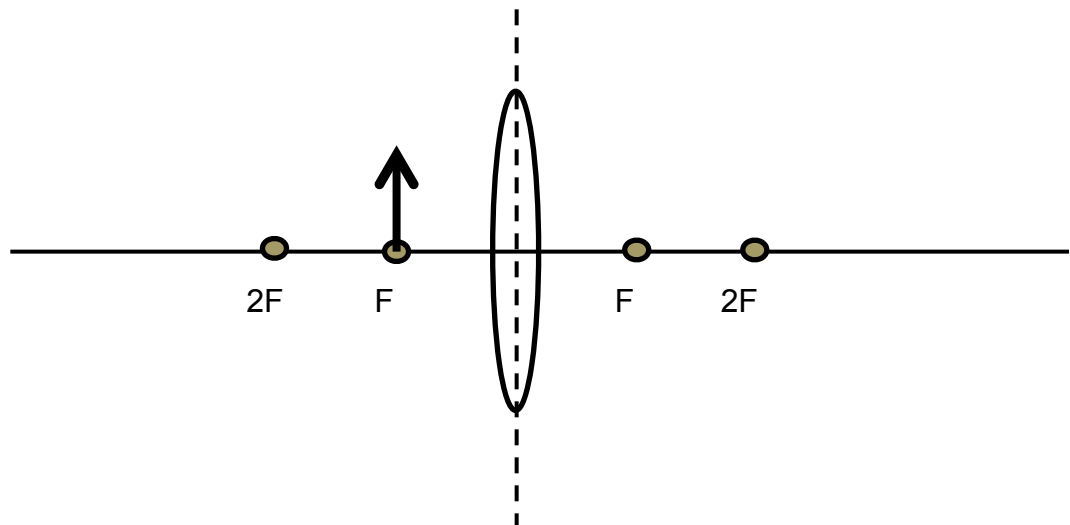
Curved Lenses
• Two types, converging and diverging
• When locating an image, you want to draw at least two rays. You can draw a ray:
   • Leaving the top of the object and running parallel the the principal axis
      • This ray will refract through F
   • Leaving the top of the object and running through the focus
      • This ray will refract through and run parallel to the principal axis
   • Travelling from the top of the object passing through the centre of the lens
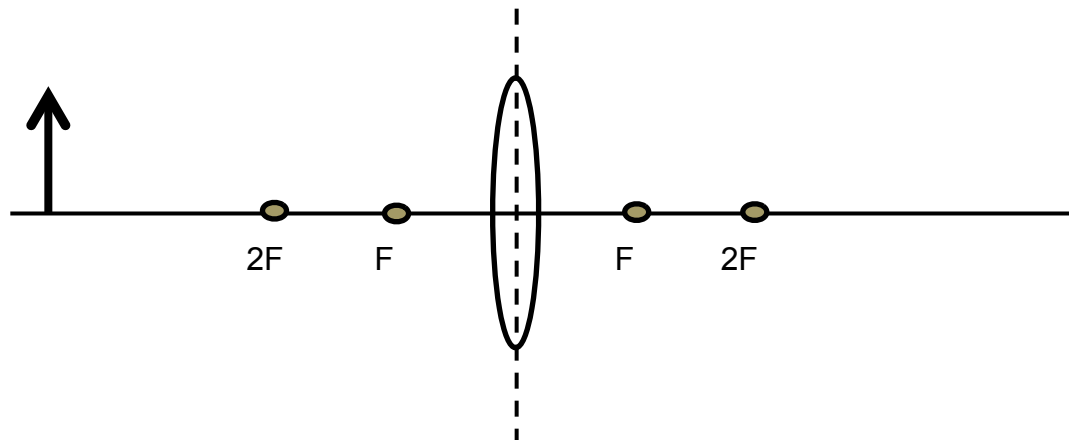   • This ray will continue to pass through the lens straight
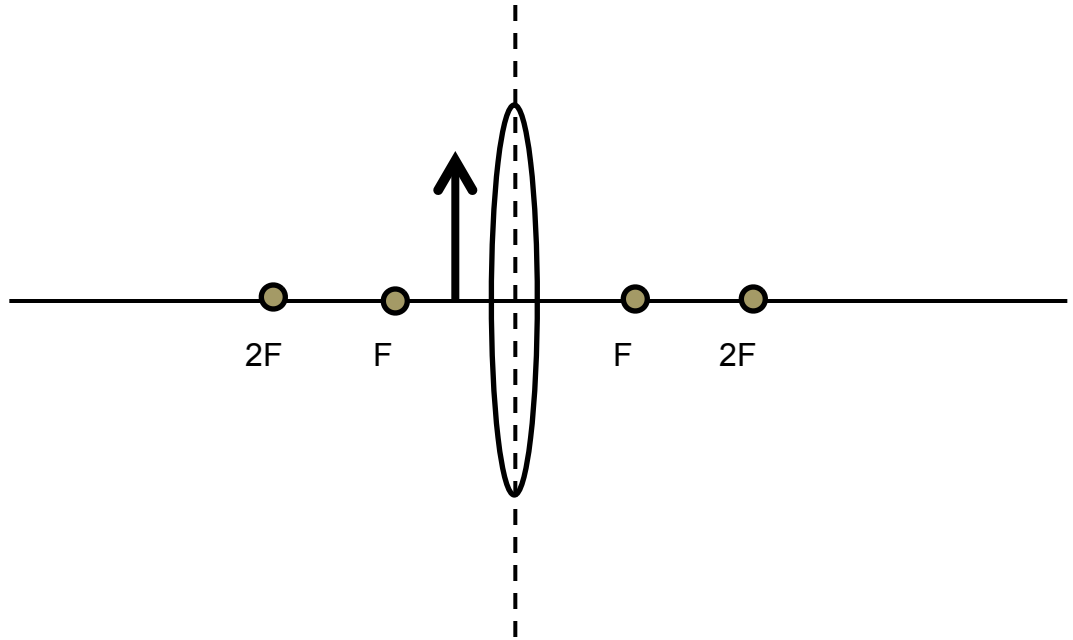Remeber SALT, you should have this memorized!

Practice

1.

2.

3.

2F   F   F   2F

4.

2F   F   F   2F