

# Chapter 13 Review

SNC 2D1

Friday May 13<sup>th</sup>

Mr. Dvorsky

# 13.1 Lenses and the Formation of Images

- Page 551 Figure 1 & 2

What are the differences between the two?

What are the shapes of the two lenses?

Look at the path of light.

Notice how no real image is formed in a diverging lens. Know the reason why.

# 13.1 Lenses and Formation of Images

- Figure 4 on page 552. Be very familiar with that diagram.
- What are there two focal points? Why is one of them  $F$  and the other  $F'$ ? Understand this!!  
-there is an  $F$  and  $F'$  because light can travel through the lens in two directions.  $F'$  is always on the same side as the object.  $F$  is on the same side as real images and opposite side of virtual.

## 13.3 Images in Lenses.

Table 1, p. 559

-know the table. –know the animations. –know the three imaging rules for a converging lens.

Remember that in a diverging lens there is only one scenario. Know that scenario.

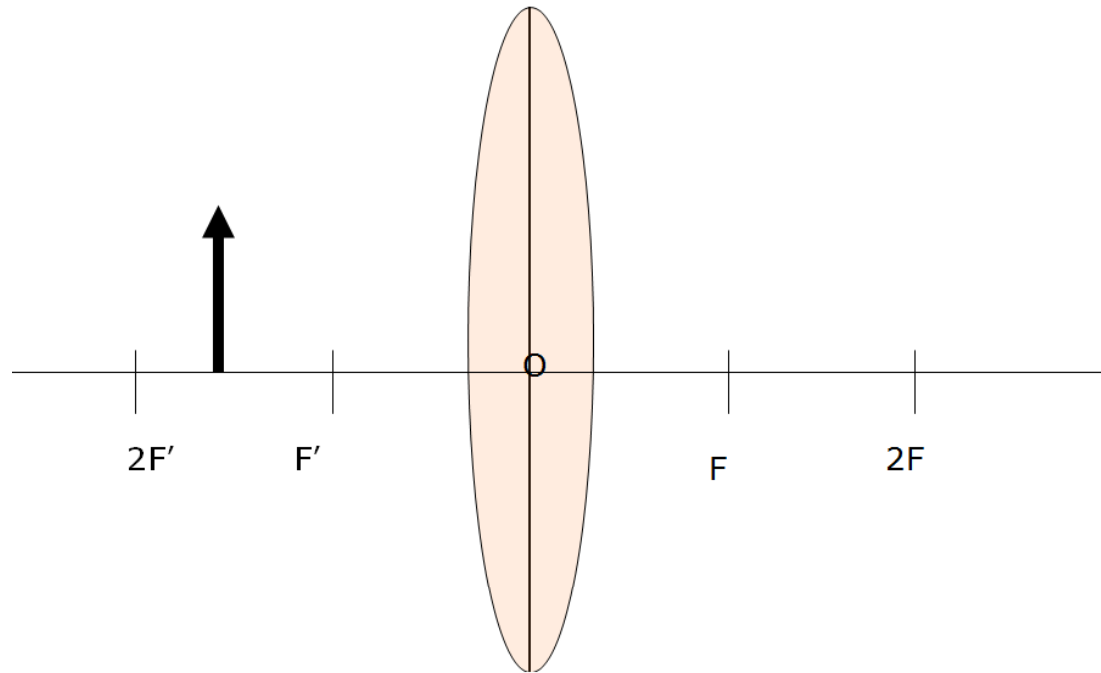
## 13.3 Images in Lenses

Thinking.

In a converging lens, in what instance will I get an image formed on the same side as  $F'$ ? In that example, where is the object located? Where exactly is the image located?

## 13.4 The Lens Equation

- Be able to solve problems like the ones we did in class.
- Recognize what all the parts of the equation are. That is to say, become very familiar with Figure 1 on page 562.



Using the Thin lens equation, locate the image for the candle in the above picture if the candle is located 17 cm from the lens and the focal length is 7 cm. Calculate the magnification of the lens.

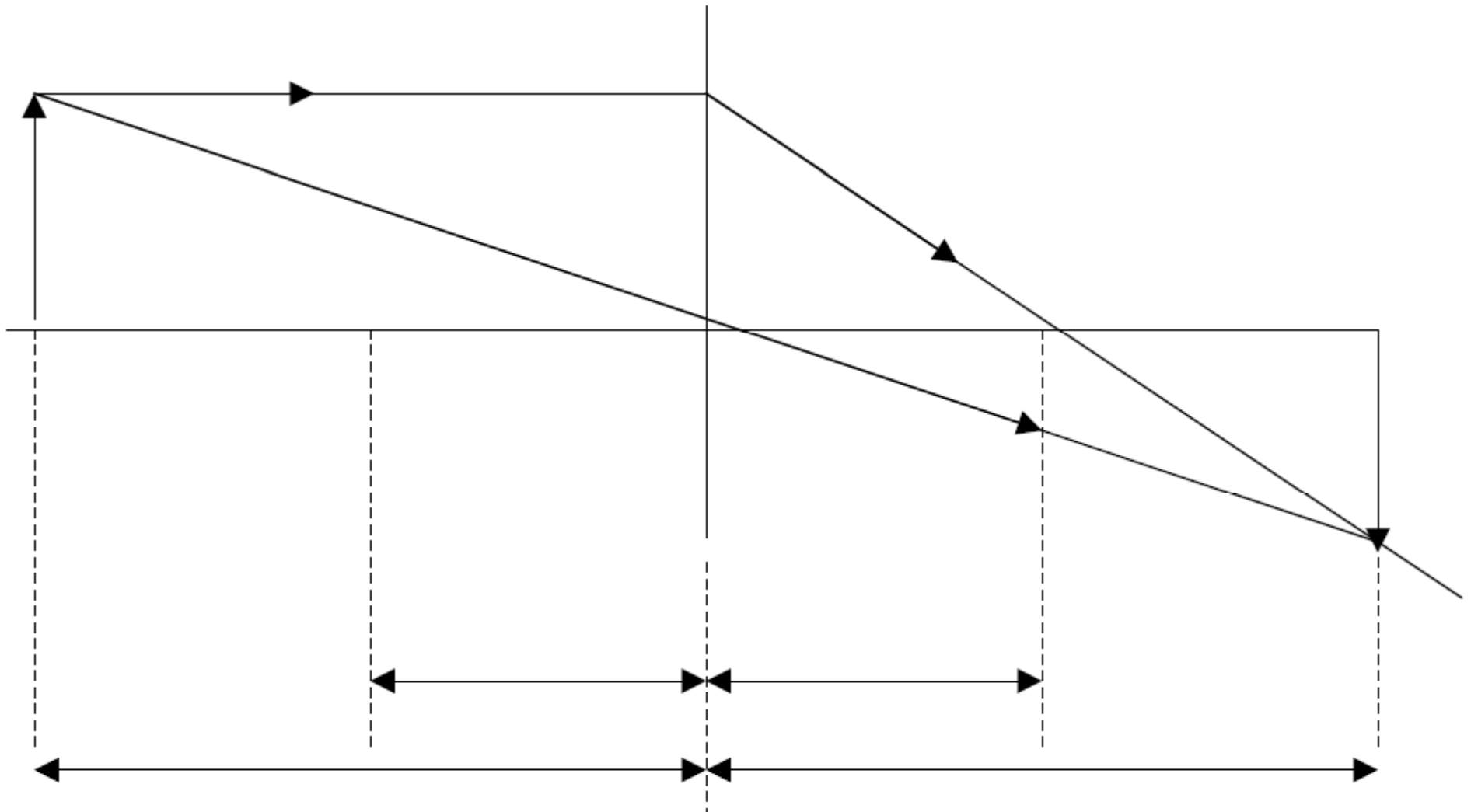
# The Lens Equation

- Example:

Mr. Dvorsky uses a converging lens with a focal length of 15 cm to examine a plant. He places the lens 5 cm from the plant. What type of image will be formed and where will it be?



# 13.4 The Lens Equation



## 13.6 The Eye

Be able to define accommodation.

-recall that unlike a camera we cannot move the lens in our eye to focus on an image.

Accommodation involves changing the focal length of the lens in the eye. How is this accomplished?

# The Eye

In class Friday we discussed how in the healthy eye, the light rays from the object are refracted in a healthy eye by the lens/cornea to the retina.

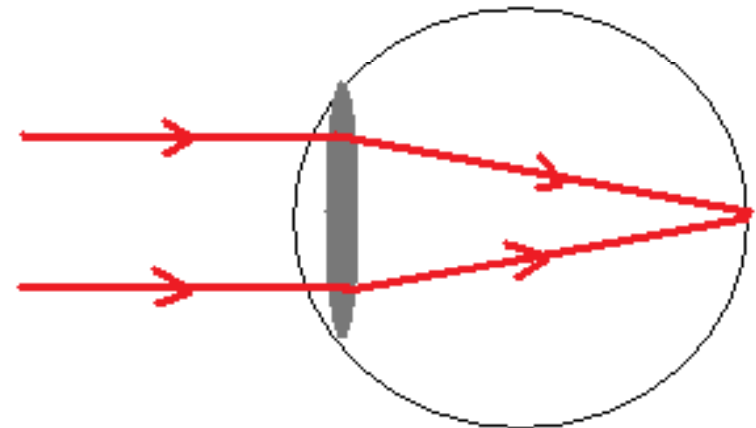
In hyperopia (farsightedness), the  $d_i$  is too small or the lens/cornea too weak, so the light rays refract and converge at a point beyond the retina.

In myopia, (nearsightedness), the  $d_i$  is too large or the lens/cornea too strong, so the light rays refract and converge at a point before the retina.

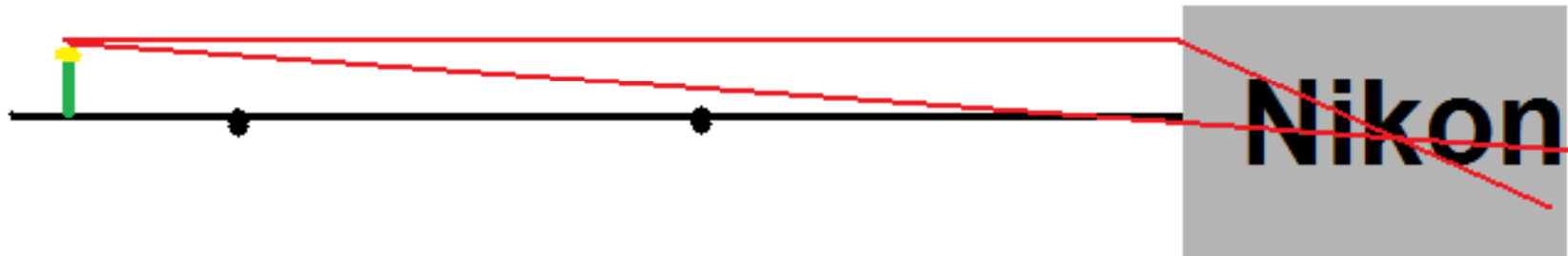
In presbyopia, the eye loses the ability for accommodation. This is caused by age. As a result the eye cannot focus.

Read section 13.6 to review this. Study the diagrams.

The healthy eye



# 13.5 Lens Applications



- The CCD – light sensitive device in digital cameras. Made of silicon. Function the same as the retina in our eyes.