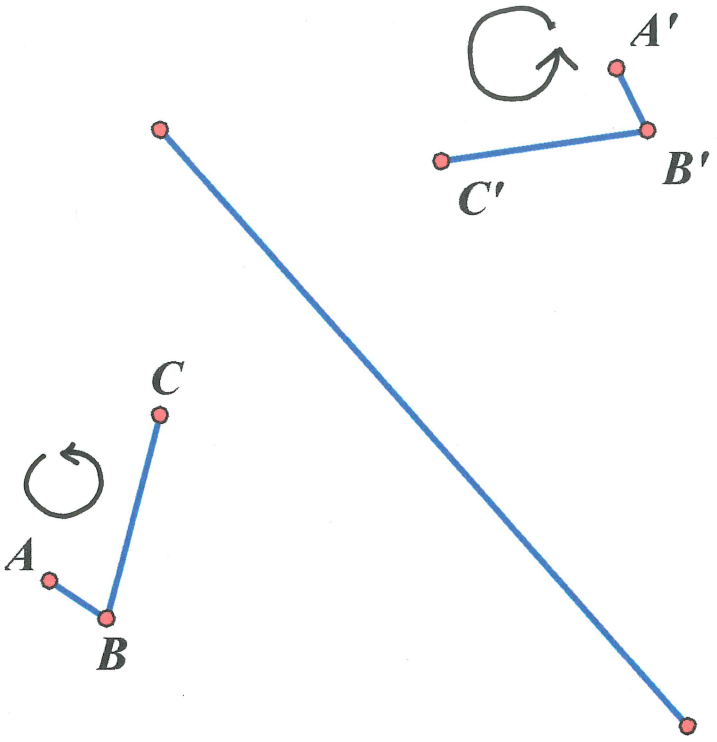
Chapter 4 Reflections – Video A

4.1 Reflections over lines and Orientation p.133 text

Here is a check mark and a line of reflection. Let's talk about the orientation of the checkmark starting at A and going counter clockwise: ABC. The initial object is in the lower left; the object with the primed letters is the final object.

R(line, checkmark).



initial checkmark

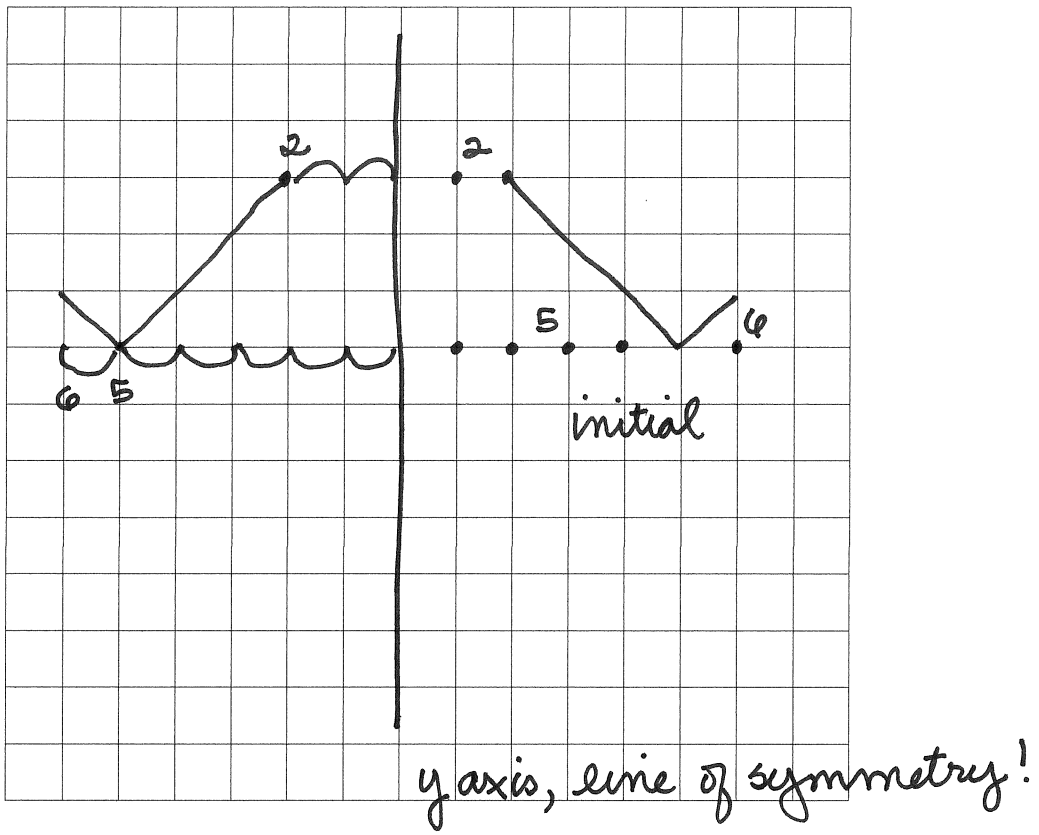
Now look at the final, start at A' and go counterclockwise A'C'B'. This is Orientation reversing because we went counterclockwise both times. Odd and Indirect are the other two terms.

initial

Notice the grade school approach: fold on the line and rub the check mark with your thumb nail!

Now let's look at one across an axis line to learn a key fact about reflections.

Let's take a flag and go from F(x,y) to F(-x, y).



Reflection Exploration

Let's COUNT the steps from each initial and final point. Do you see that the y axis BISECTS the distances? The initial and final images are equidistant from the axis! This is a key fact about reflections. Be sure to file it away.

Chapter 4 Popper Question 3

The reflection is the basic rigid motion. Each of the other 3 motions is a composition of two or more reflections.

A. True B. False

Now just one more and a tip about the initial object: make sure it's asymmetric!

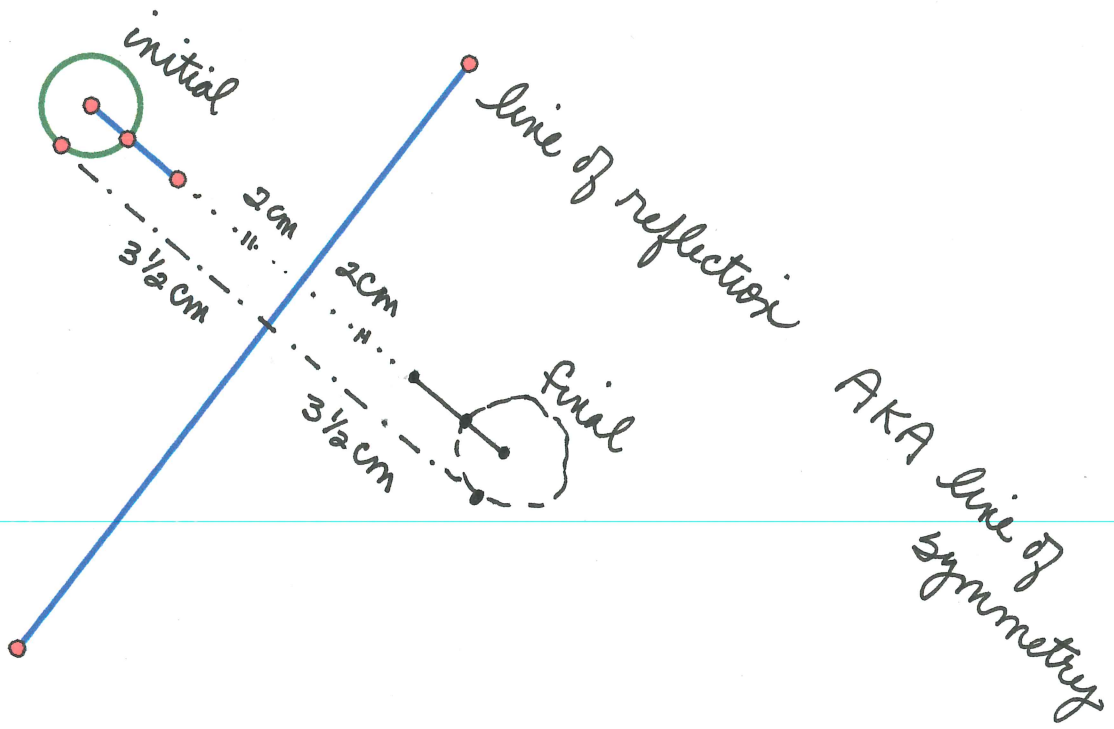
If you reflect a plain circle you'll be able to see it just fine, but you won't be able to point out the reversal in orientation! So now, suppose you want to:

Find a final image given an initial image and line without folding the paper.

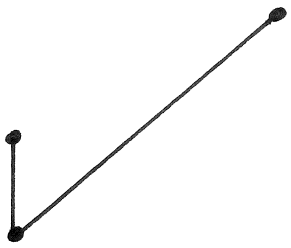
How can you do this efficiently? Let's talk about that!

Connect an each initial point with a line perpendicular to the line of reflection. Measure the distance from the initial point to the reflection line and move that far over on the perpendicular line on the other side.

What do you find each time? The line of reflection is the perpendicular bisector of the lines connecting the important points! A key fact!



Now let's work BACKWARDS for a bit. It's important to know this backwards and forwards. So next is a initial image and one that has been reflected. Where is the line of reflection for this situation? The picture is on next page. Think for a moment how we are going to figure this one out! Well let's talk symmetry!



Chapter 4 Popper Question 4

The line of reflection could be called a line of symmetry for the two images.

A. True

B. False

Chapter 4 Essay 1

Write an essay about the line of reflection? Why do we need it?

What is it good for? Why do we care about it?

Homework Question

4.1 #2 now note that the reflection is called T in the problem statement and F in part b. Just roll with it and use the reflection about the origin transformation given.

Add part e. WHY can this be thought of as a rotation about the origin.

Note too: the illustration for it is top of the next page!

So: two popper questions, 1 essay, and 1 homework problem with an extra part.

Next up Translations!