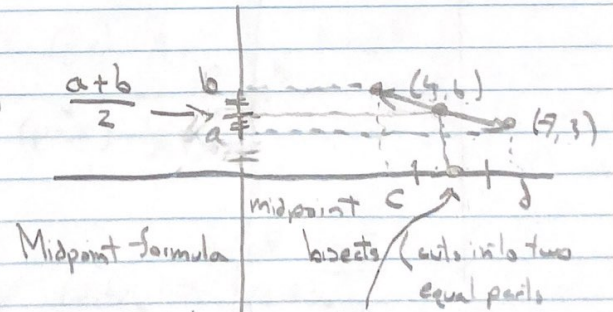
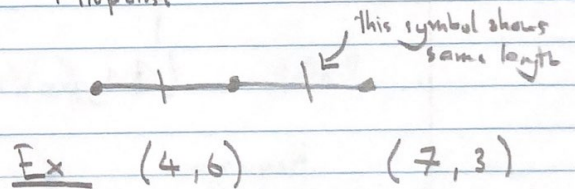
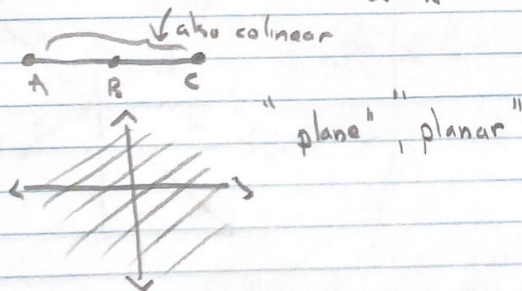
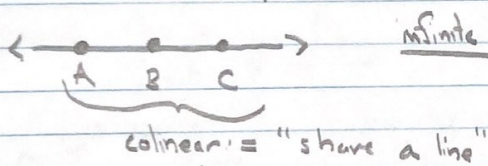
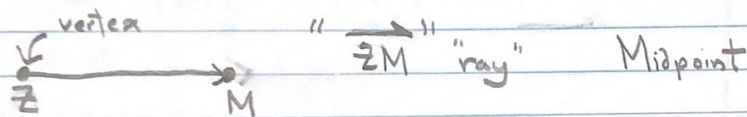
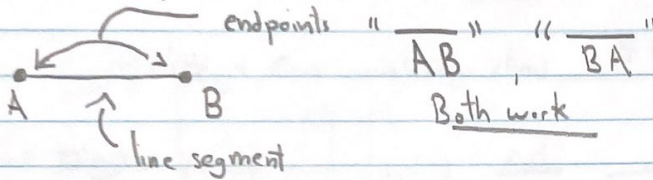


# Lesson 1.

B. A point



$$\left( \frac{c+d}{2}, \frac{a+b}{2} \right) \quad \frac{k+j}{2}$$

(4, 6) and (7, 3) midpoint?

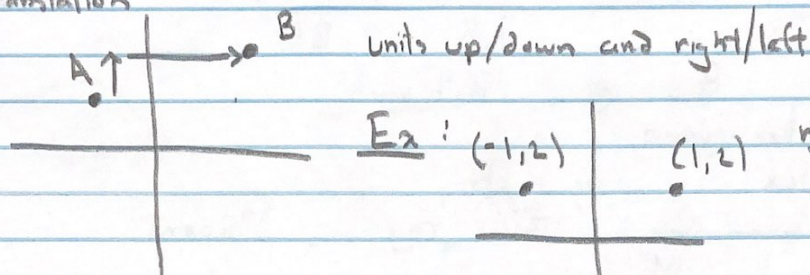
$$\left( \frac{4+7}{2}, \frac{6+3}{2} \right) \Rightarrow \left( \frac{11}{2}, \frac{9}{2} \right)$$



# Lesson 1 Continued (Rigid Transformations and Nonrigid Transformations)

## Transformation Types

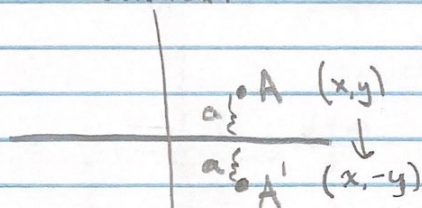
### Translation



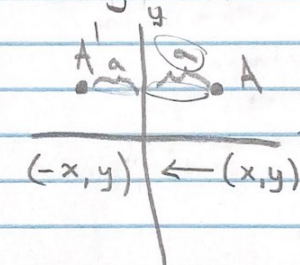
Ex:  $(-1, 2) \rightarrow (1, 2)$  right two units

### Reflection (3 types)

Across x axis

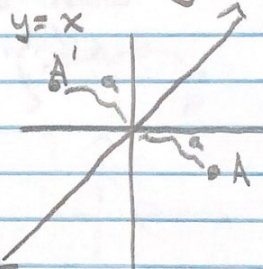


Across y axis



3rd type

Across any line



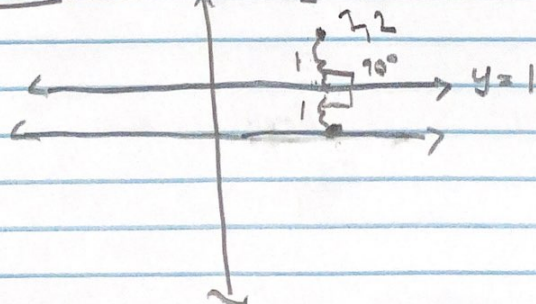
Ex: Reflect across y axis (A)

$A'(-2, 2) \rightarrow (2, 2)$  Reflect across x axis (A'')

### Terminology

lines that never cross  
(formalize later)

Ex: Reflect across  $y=1$

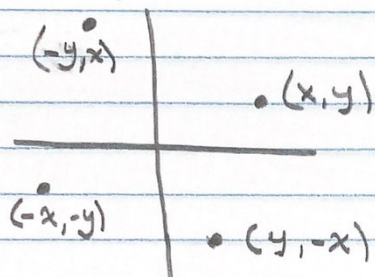


perpendicular /  
orthogonal



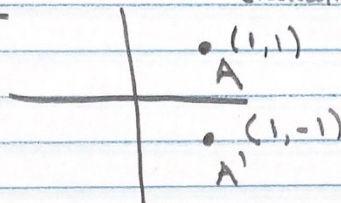
## Lesson 1 Continued

### Rotation



Ex

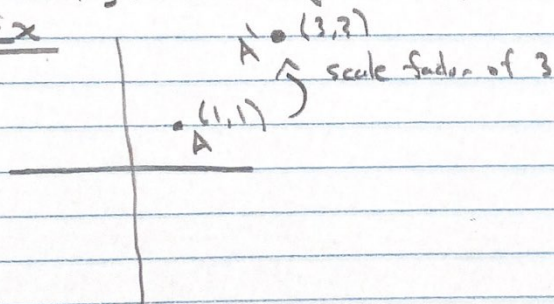
90° clockwise



### Dilation (multiplying by a scale factor)

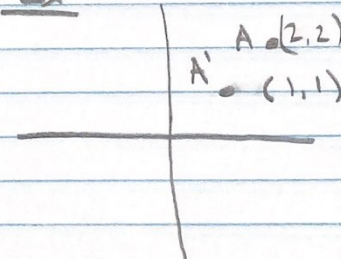
$$(x, y) \rightarrow (k \cdot x, k \cdot y)$$

Ex



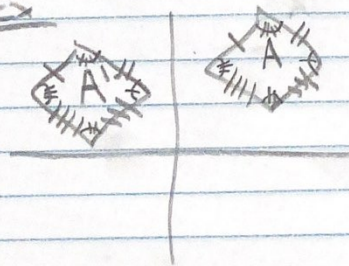
Ex

Scale factor  $\frac{1}{2}$



Rigid transformation preserves length of line segments, angles

Ex



Translation Properties

- 1] preserves length
- 2] preserves angles