

Not isometry

→ Dilation except factor of 1 & -1.

ellipse

$$\frac{x^2}{9} + \frac{y^2}{10} = 1 \quad \text{Find } x \text{ \& } y\text{-int.}$$

$$(x\text{-int}) \rightarrow \frac{x^2}{9} = 1, \quad x = \pm 3$$


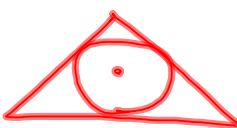
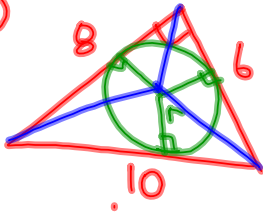
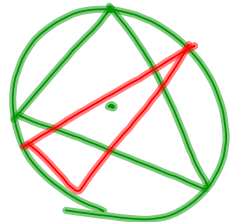
$$(y\text{-int}) \rightarrow \frac{y^2}{10} = 1, \quad y = \pm \sqrt{10}$$

$$x\text{-int} = \pm 2$$

$$y\text{-int} = \pm 5$$

Find an eq. of ellipse centered at (0,0)

$$\frac{x^2}{4} + \frac{y^2}{25} = 1$$

Triangle	centers.	prop.
Centroid	intersection of medians	1) 6 equal areas. 2) Medians are trisected (2:1)  3) in coord. Geo. $\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3} \right)$
Incenter	intersection of angle bisectors	1)  2) it is equidist. away from 3 sides (*radii)
		ex)  $A = \frac{1}{2} \cdot 6 \cdot 8 = 24$ $A = \frac{1}{2} 10 \cdot r + \frac{1}{2} \cdot 6 \cdot r + \frac{1}{2} 8 \cdot r$ $24 = 12r$ $2 = r$
Circumcenter	intersection of perpendicular bisectors	1)  2) it is equidist. away from vertices.
Orthocenter	intersection of Altitudes	

Find the circumcenter of $\triangle ABC$.

$$A(4, 4) \quad m_{BC} = 2 \rightarrow -\frac{1}{2}$$

$$B(1, 5) \quad \text{Midpt } (-1, 1)$$

$$C(-3, -3) \quad y - 1 = -\frac{1}{2}(x + 1)$$

$$m_{AC} = 1$$

$$\text{Midpt} = (.5, .5)$$

$$\underline{y - .5 = -1(x - .5)}$$

$$-1(x - .5) + .5 = -\frac{1}{2}(x + 1) + 1$$

$$-x + .5 + .5 = -\frac{1}{2}x - .5 + 1$$

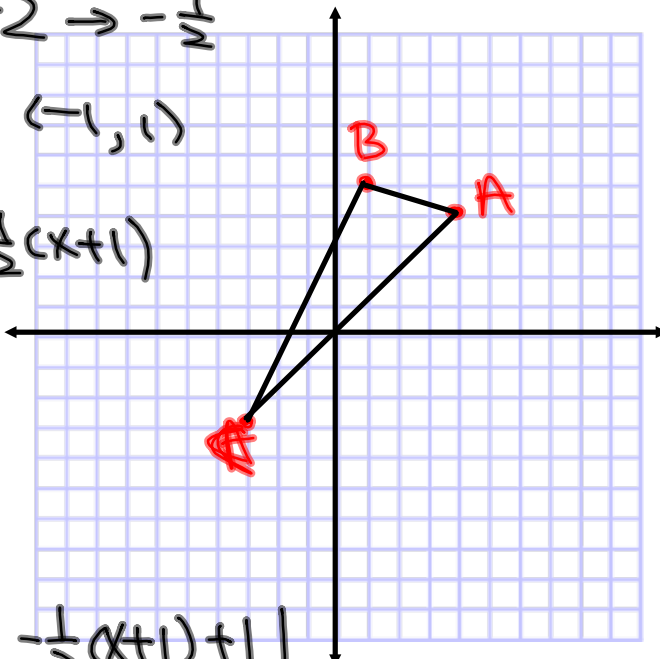
$$.5 = \frac{1}{2}x$$

$$(1 = x)$$

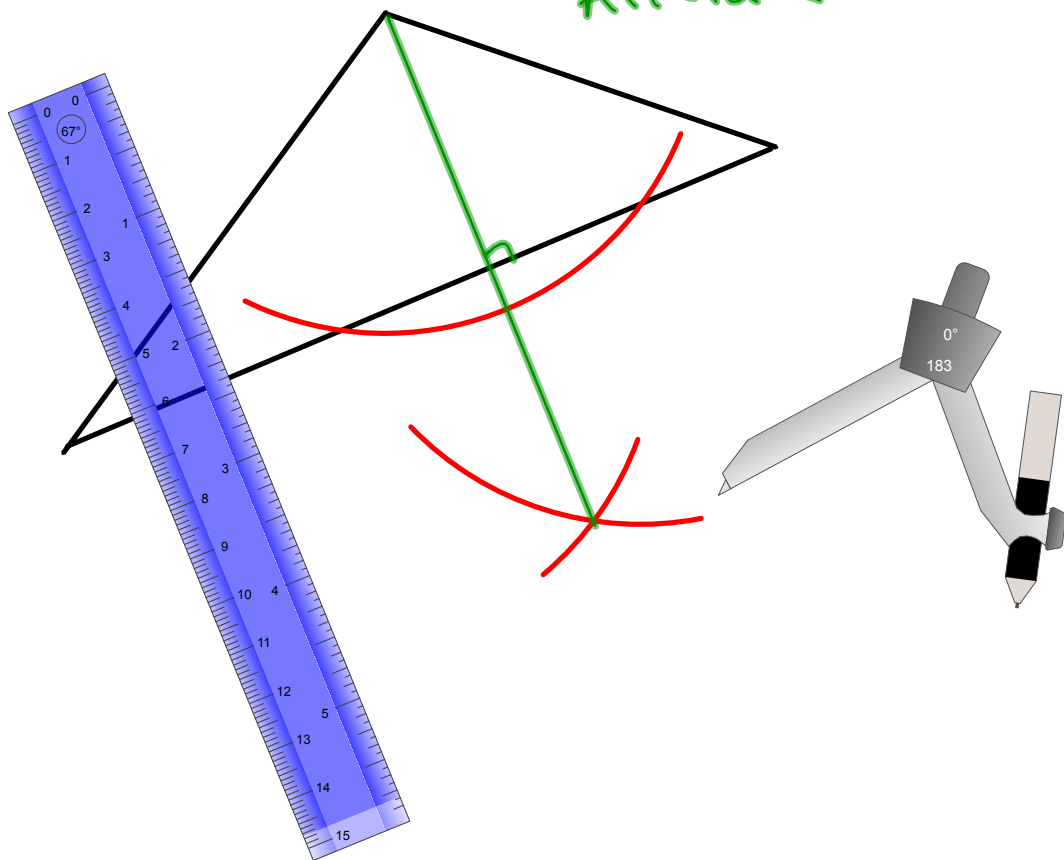
$$y - .5 = 1(1 - .5)$$

$$y - .5 = .5$$

$$(y = 1)$$



Altitude



glide reflection.

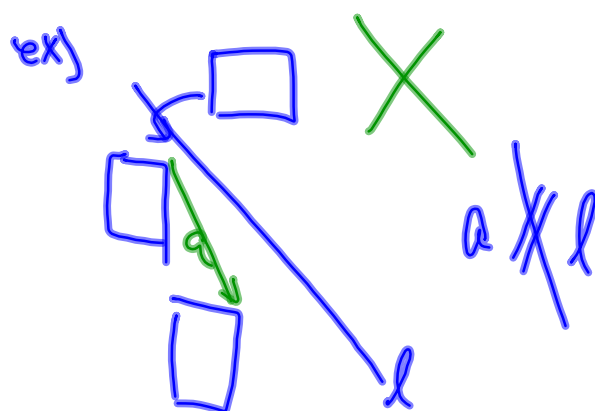
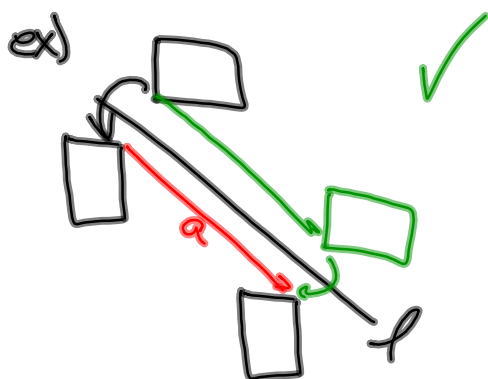
composition of σ_l & T_a

where $a \parallel l$.

$$\sigma_l \circ T_a$$

or

$$T_a \circ \sigma_l$$



\overline{AB} , $A(2,7)$ & $B(7,-3)$

if C is b/w A & B

$$AC:CB = 4:1$$

Find C .

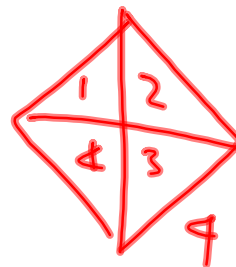
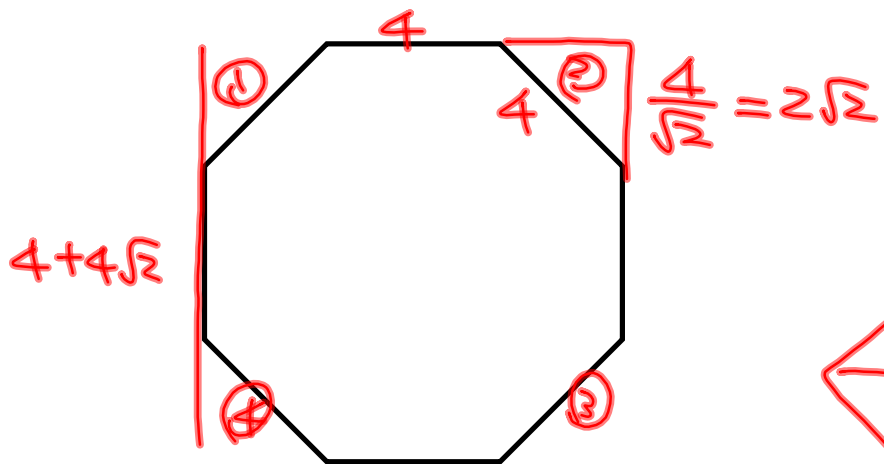


$$x: 7-2=5$$

$$y: -3-7=-10$$

$$\begin{array}{l} 2 + 1(4) \\ 2 + 4 \\ (6, -1) \end{array} \quad \begin{array}{l} 4x + x = 5 \\ 5x = 5 \\ x = 1 \\ 7 + -2(1) \\ 7 - 2 \\ -1 \end{array}$$

$$\begin{array}{l} 4y + y = -10 \\ 5y = -10 \\ y = -2 \end{array}$$



$$(4+4\sqrt{2})^2 - 4^2$$

$$\cancel{16} + 32\sqrt{2} + 32 - \cancel{16}$$

$$= 32 + 32\sqrt{2}$$

