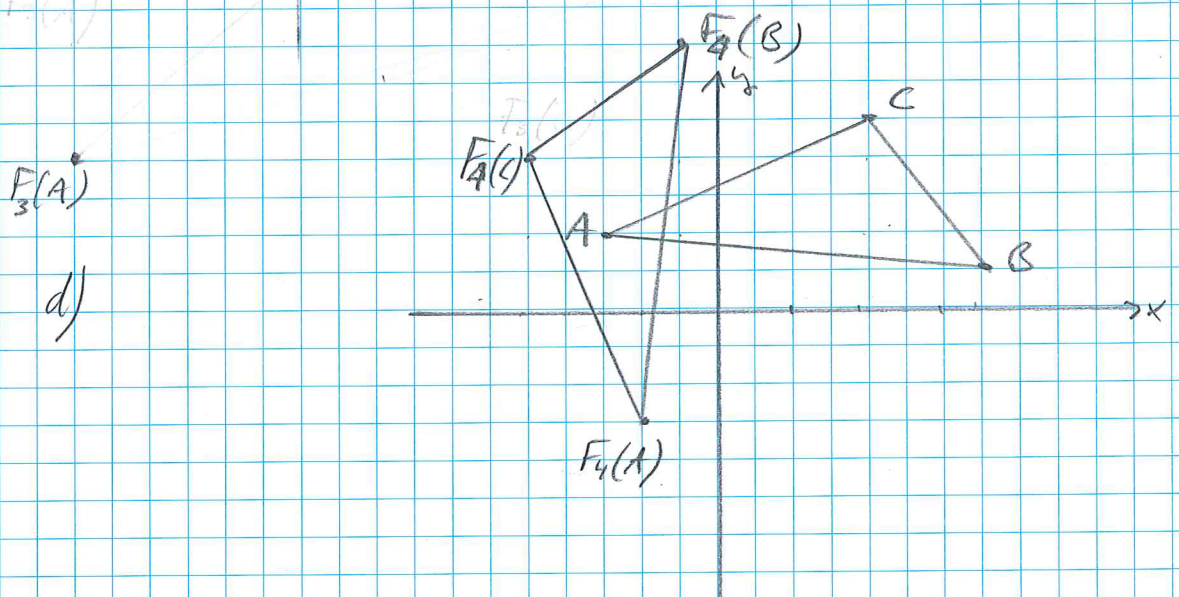
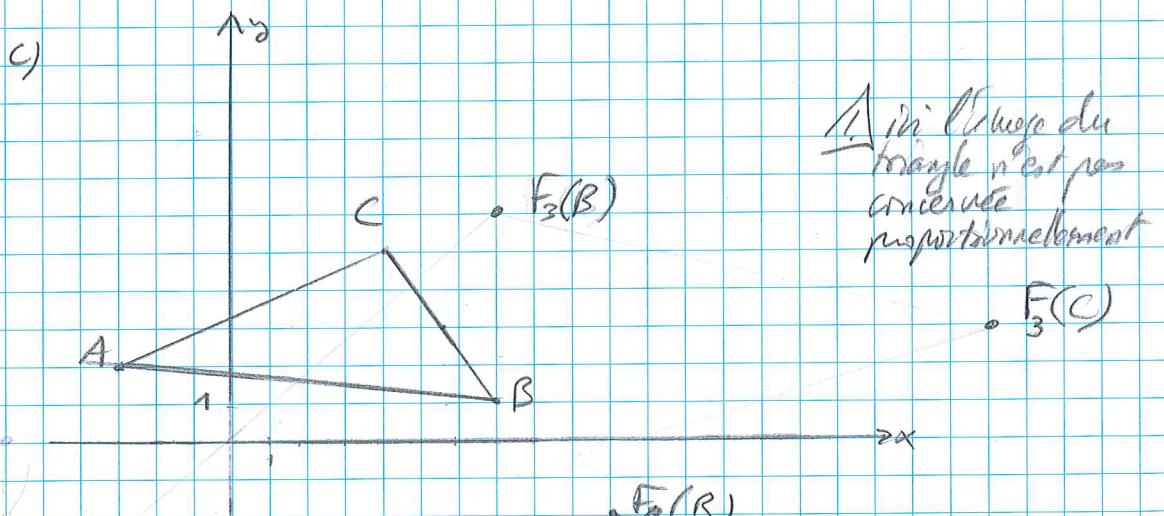
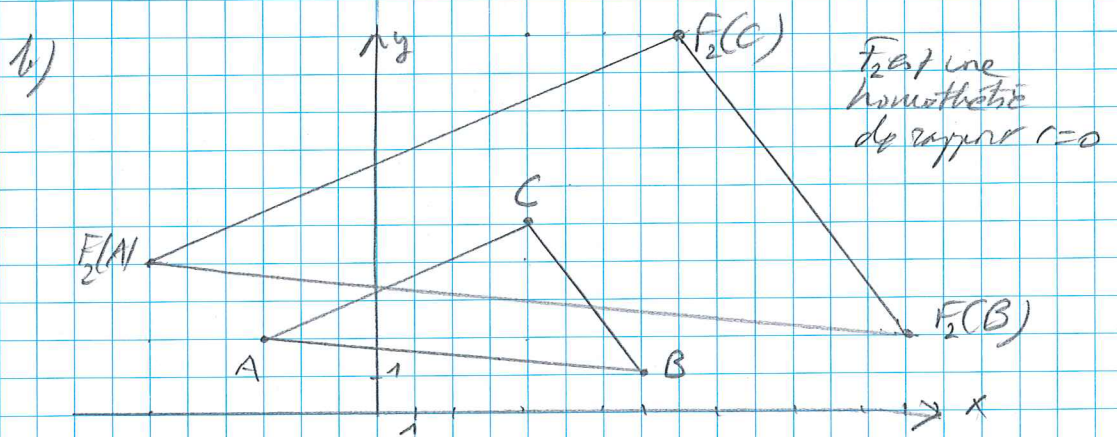
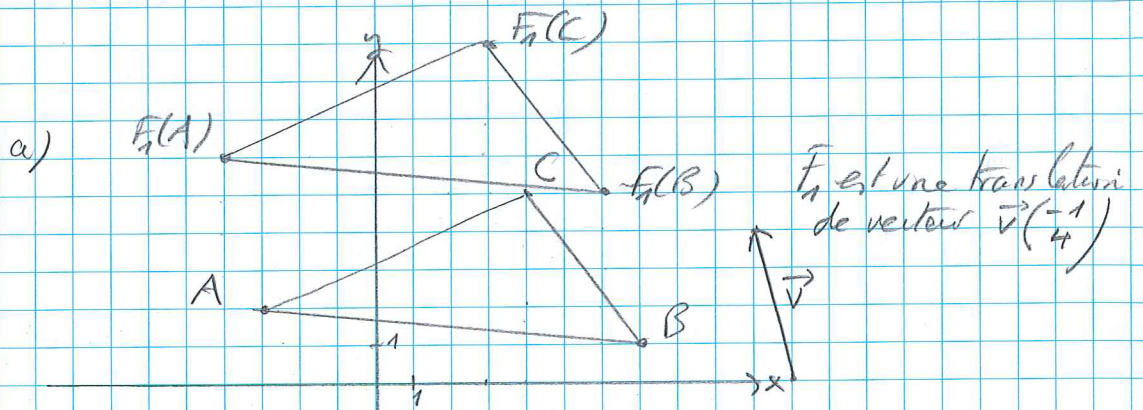


ex 13



ex 14

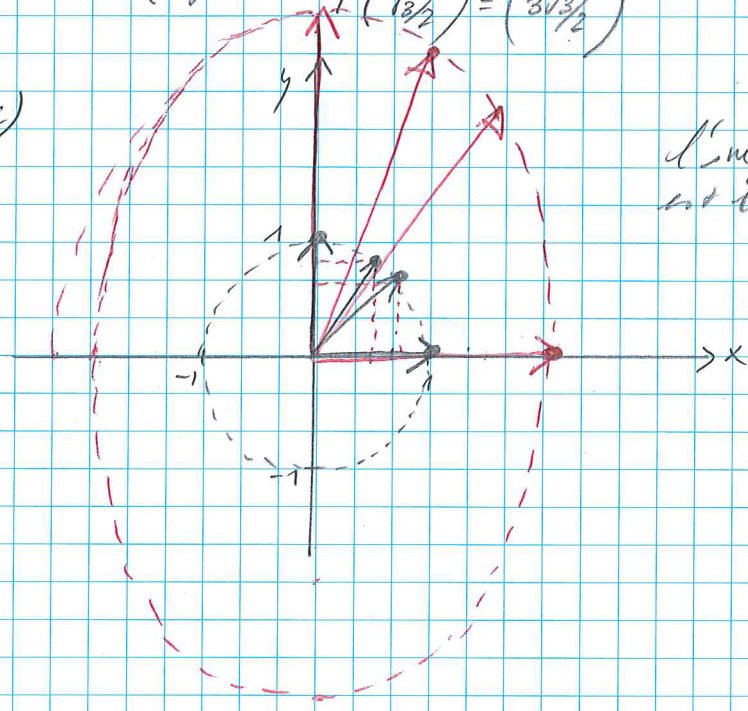
a) $F\begin{pmatrix} 1 \\ 0 \end{pmatrix} = \begin{pmatrix} 2 \\ 0 \end{pmatrix}$

$F\begin{pmatrix} 0 \\ 1 \end{pmatrix} = \begin{pmatrix} 0 \\ 3 \end{pmatrix}$

$F\begin{pmatrix} \sqrt{2}/2 \\ \sqrt{2}/2 \end{pmatrix} = \begin{pmatrix} \sqrt{2} \\ 3\sqrt{2}/2 \end{pmatrix} = \sqrt{2} \begin{pmatrix} 1 \\ 3/2 \end{pmatrix}$

$F\begin{pmatrix} 1/2 \\ \sqrt{3}/2 \end{pmatrix} = \begin{pmatrix} 1 \\ \sqrt{3}/2 \end{pmatrix}$

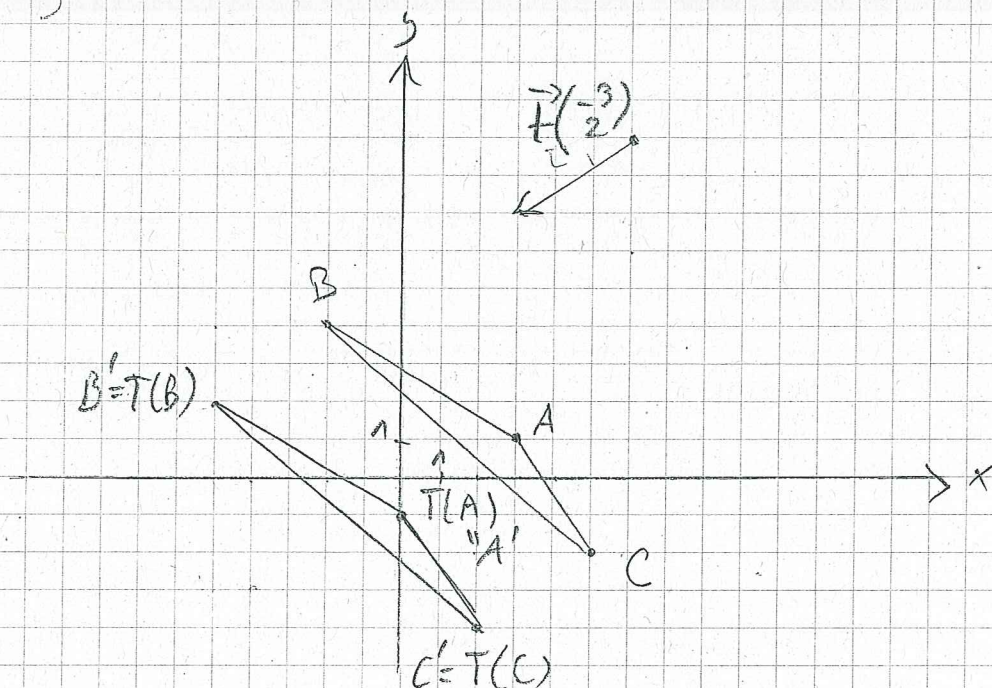
b) c)



l'image du cercle trig. est l'ellipse rouge !

ex 15

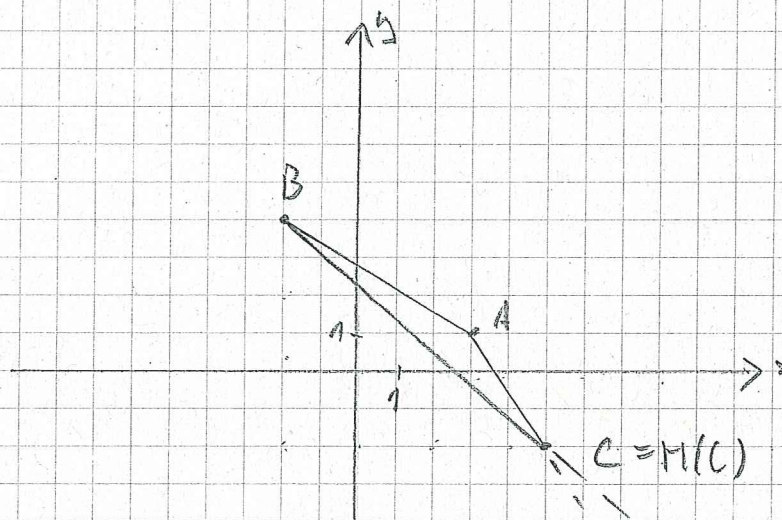
(a)



$$\begin{aligned}
 T(A) &= (3-3; 1-2) = (0; -1) & \text{ou} & T\left(\begin{pmatrix} 3 \\ 1 \end{pmatrix}\right) = \begin{pmatrix} 3 + (-3) \\ 1 + (-2) \end{pmatrix} = \begin{pmatrix} 0 \\ -1 \end{pmatrix} \\
 T(B) &= (-2-3; 4-2) = (-5; 2) & \text{ou} & T\left(\begin{pmatrix} -2 \\ 4 \end{pmatrix}\right) = \begin{pmatrix} -2 + (-3) \\ 4 + (-2) \end{pmatrix} = \begin{pmatrix} -5 \\ 2 \end{pmatrix} \\
 T(C) &= (5-3; -2-2) = (2; -4) & \text{ou} & T\left(\begin{pmatrix} 5 \\ -2 \end{pmatrix}\right) = \begin{pmatrix} 5 + (-3) \\ -2 + (-2) \end{pmatrix} = \begin{pmatrix} 2 \\ -4 \end{pmatrix}
 \end{aligned}$$

$T(\triangle ABC)$ est le triangle $\triangle A'B'C'$

(b)

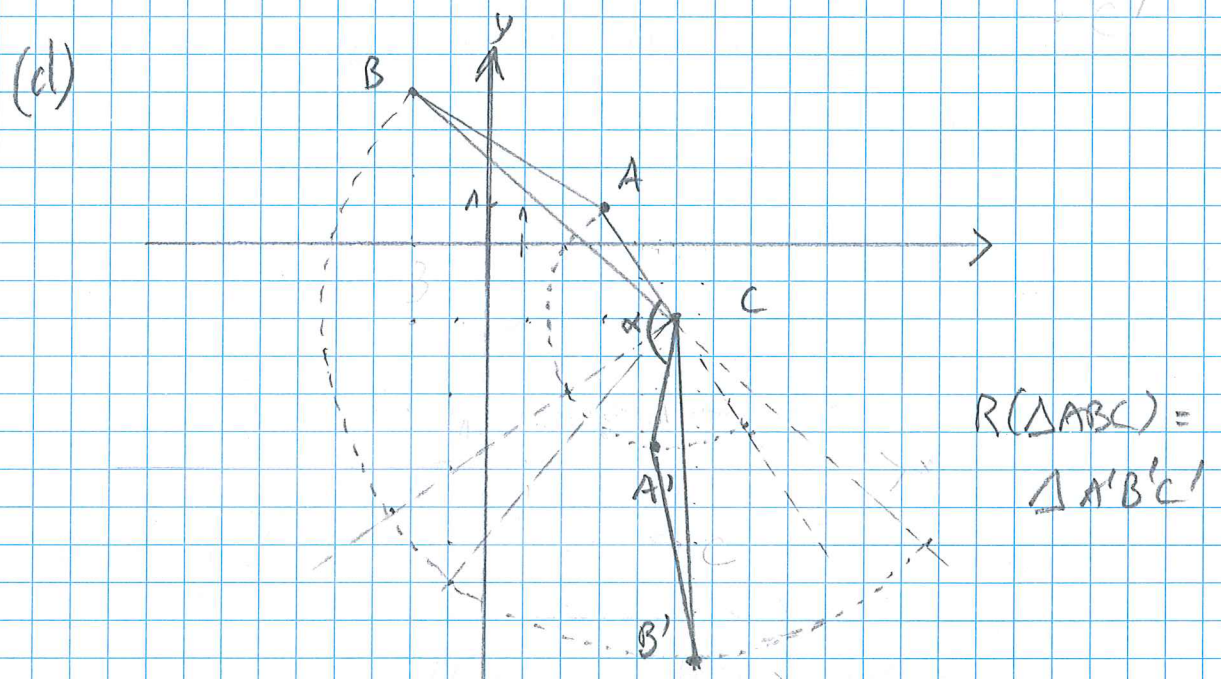
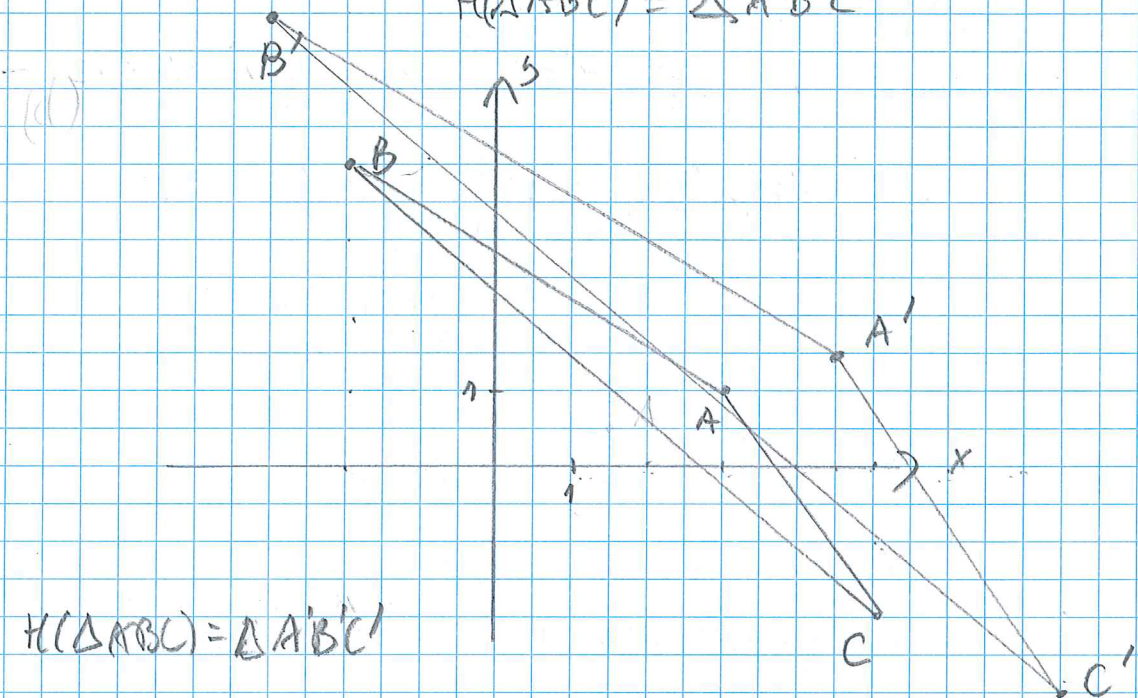


$$\begin{aligned}
 H(A) &= (5 + (-2)(5-5); -2 + (-2)(1-5)) \\
 &= (9; -8) = A' \\
 H(B) &= (5 + (-2)(5-5); -2 + (-2)(4-5)) \\
 &= (-19; -14) = B' \\
 H(C) &= C = C' \\
 H(\triangle ABC) &= \triangle A'B'C'
 \end{aligned}$$

$$H(A) = A'$$

$$H(B) = B'$$

(c) idem que (b): $H(A) = (4,5; 1,5) = A'$
 $H(B) = (-3; 6) = B'$
 $H(C) = (7,5; -3) = C'$
 $H(\triangle ABC) = \triangle A'B'C'$



$$\begin{aligned} R(A) &= \left(5 + \cos(135)(3-5) - \sin(135)(1-(-2)) ; -2 + \sin(135)(3-5) + \cos(135)(1-(-2)) \right) \\ &= \left(5 + \left(\frac{-\sqrt{2}}{2}\right)(-2) - \frac{\sqrt{2}}{2} \cdot 3 ; -2 + \frac{\sqrt{2}}{2}(-2) + \left(\frac{-\sqrt{2}}{2}\right) \cdot 3 \right) \\ &= \left(5 - \frac{\sqrt{2}}{2} ; -2 - \frac{5\sqrt{2}}{2} \right) \approx (4,3; -5,5) \end{aligned}$$

$$\begin{aligned} R(B) &= \dots = \left(5 - \frac{\sqrt{2}}{2}(-7) - \frac{\sqrt{2}}{2} \cdot 6 ; -2 + \frac{\sqrt{2}}{2}(-7) - \frac{\sqrt{2}}{2} \cdot 6 \right) = \left(5 + \frac{\sqrt{2}}{2} ; -2 - \frac{13\sqrt{2}}{2} \right) \\ &\approx (5,7; -11,2) \end{aligned}$$

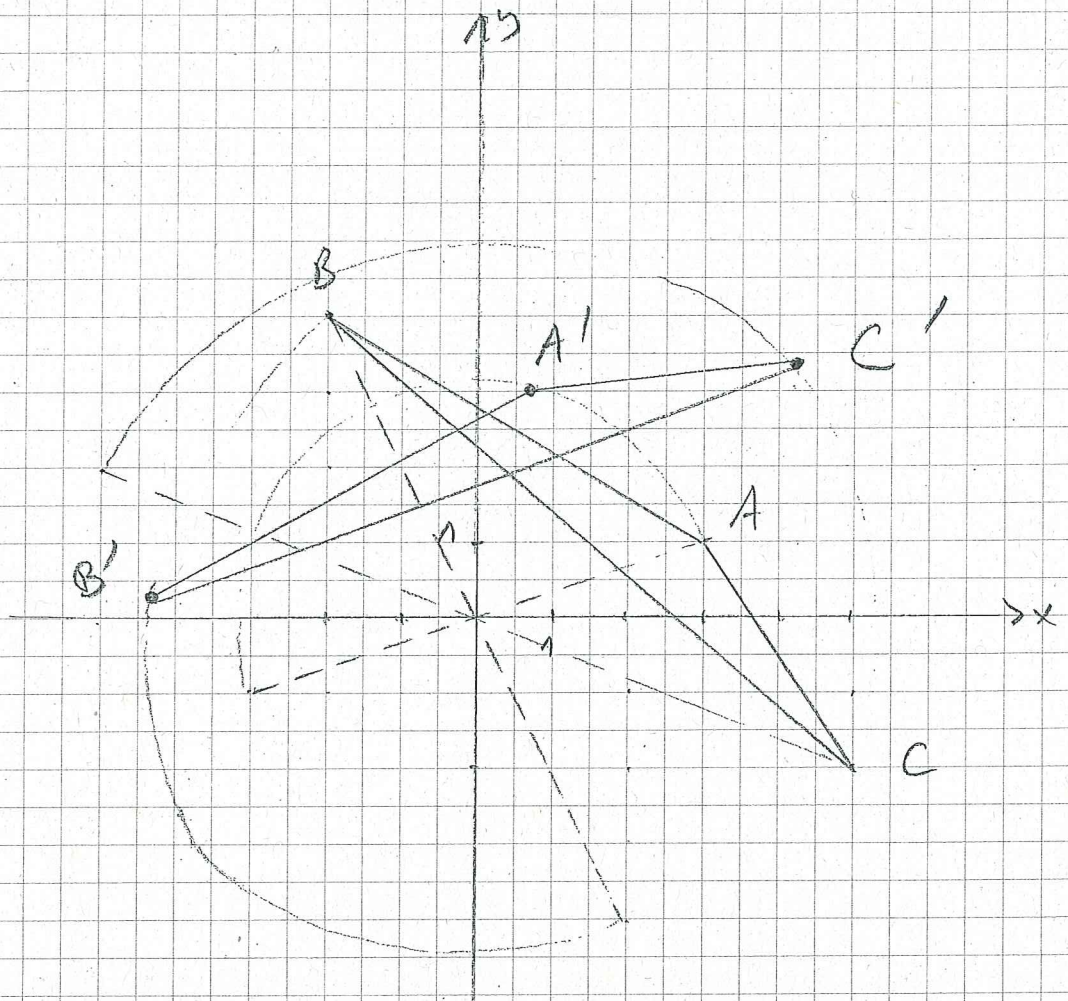
$$R(C) = C$$

(e) idem que (d) :

$$A' = R(A) = \left(\cos\left(\frac{\pi}{3}\right) \cdot 3 - \sin\left(\frac{\pi}{3}\right) \cdot 1; \sin\left(\frac{\pi}{3}\right) \cdot 3 + \cos\left(\frac{\pi}{3}\right) \cdot 1 \right) \\ = \left(\frac{1}{2} \cdot 3 - \frac{\sqrt{3}}{2} \cdot 1; \frac{\sqrt{3}}{2} \cdot 3 + \frac{1}{2} \cdot 1 \right) = \left(\frac{3-\sqrt{3}}{2}; \frac{3\sqrt{3}+1}{2} \right) \approx (0,63; 3,1)$$

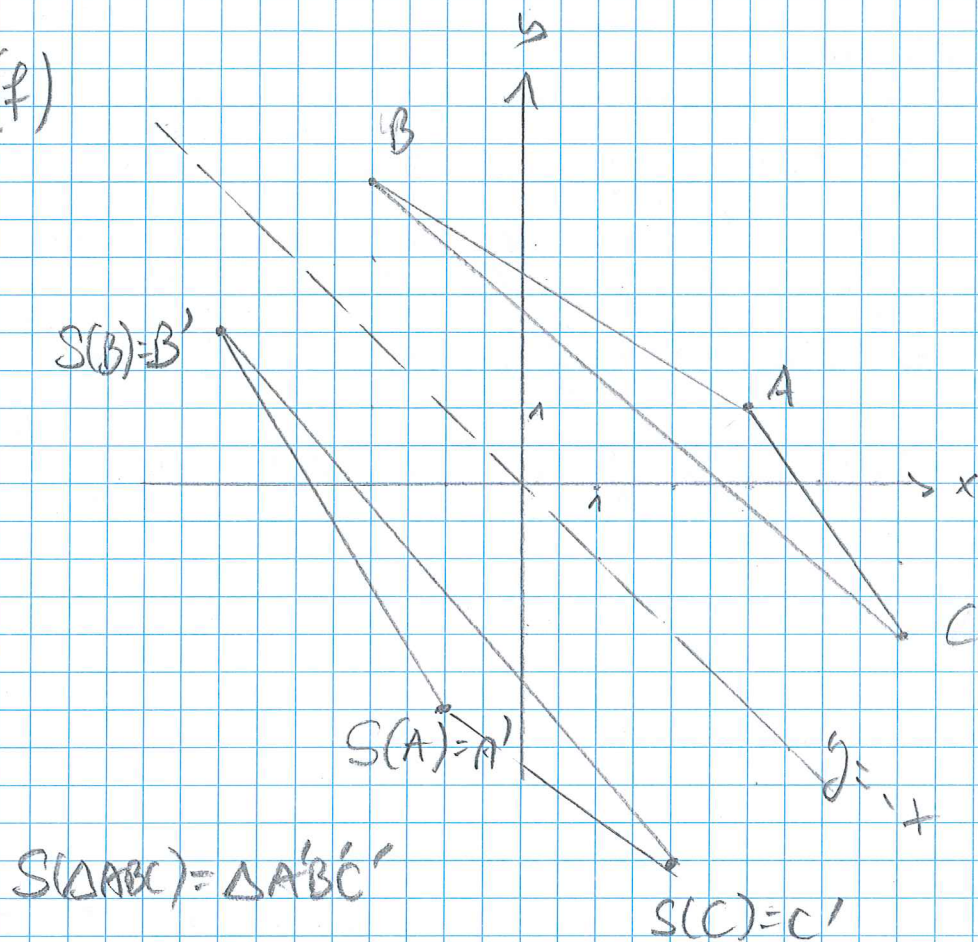
$$B' = R(B) = \left(\frac{1}{2}(-2) - \frac{\sqrt{3}}{2} \cdot 4; \frac{\sqrt{3}}{2}(-2) + \frac{1}{2} \cdot 4 \right) = (-1-2\sqrt{3}; -\sqrt{3}+2) \approx (-4,46; 0,79)$$

$$C' = R(C) = \left(\frac{1}{2} \cdot 5 - \frac{\sqrt{3}}{2}(-2); \frac{\sqrt{3}}{2} \cdot 5 + \frac{1}{2}(-2) \right) = \left(\frac{5+2\sqrt{3}}{2}; \frac{5\sqrt{3}-2}{2} \right) \approx (4,23; 3,33)$$

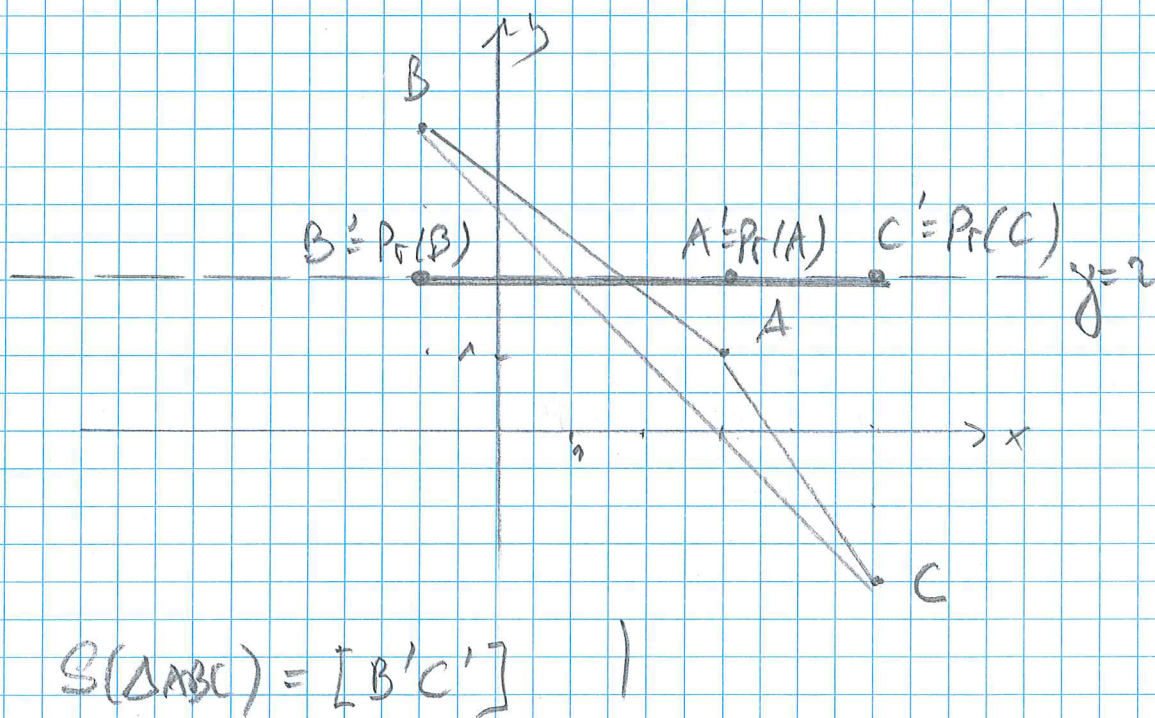


$$R(\triangle ABC) = \triangle A'B'C'$$

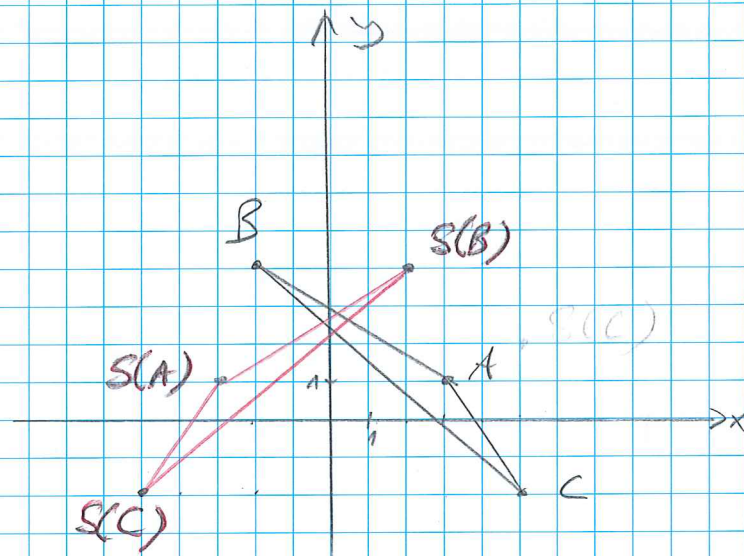
(f)



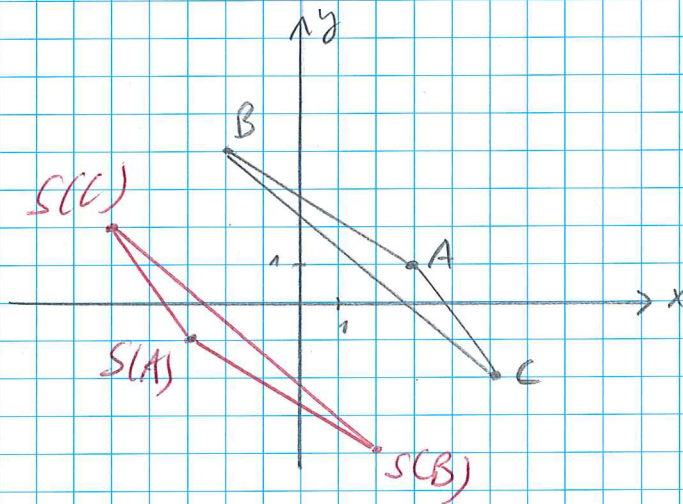
(g)



(h)



(i)



ex 16

