Thus, S is the midpt of [MB] (by converse of midpt theorem in a $\triangle$)

5) MROS is a rect. (proved)
So, $SR = OM = 2cm$ (diagonals of a rect. are equal)
I is intersection pt of [SR] + [OM] (given)
then, I is midpt of [RS]
Thus, $RI = \frac{SR}{2} = 1cm$.

6). O is midpt of [AB] (proved)
So, $\vec{MA} + \vec{MB} = 2\vec{MO}$ (median + vectors)
but G is centroid of $\triangle$ AMB (given)
So, $\vec{MO} = 3\vec{GO}$ (property of centroid)
Thus, $\vec{MA} + \vec{MB} = 2(3\vec{GO})$
$= 6\vec{GO}$. (by substitution)

7) K is image of S by $\vec{OM}$ (given)
So, $\vec{SK} = \vec{OM}$.
So, $\vec{SO} = \vec{KM}$ / then (SO) // (KM).
but, MROS is a rect (proved)
So, (SO) // (RM) (opp. sides of a rect.)
hence (RM) // (KM) (2 st. lines parallel to same st. line are parallel)
but M is a common pt.
Thus, pts K, M + A are collinear.

8a) In $\triangle$ MAB we have:
$A\hat{M}B = 90°$ (proved)
$AM = 2cm$
$AB = 4cm$ } (given)
So, $AM = \frac{1}{2} AB$.
Thus, $\triangle$ AMB is a semi-equilateral $\triangle$ ($90°$ + smallest side = $\frac{1}{2}$ hyp)