Geometry check-ups: Sample answers
http://topdrawer.aamt.edu.au/Geometric-reasoning/Misunderstandings/Similar-or-congruent/What-is-wrong-with-this-proof

1. In the diagram below, $A E=E C$ and $B E=D E . \angle A E B=90^{\circ}$.

(a) Prove that $\triangle A B E \equiv \triangle C D E$.
(b) Hence or otherwise prove that $A B \| D C$.

$$
\begin{gathered}
\therefore \triangle A B E \equiv \triangle C D E(R H S) \\
\text { b) } A B=D C\binom{\text { matchingsides of }}{\text { congruent } \triangle \text { 's }} \\
\therefore A B \| D C \\
\text { a) In } \triangle A B E \text { and } \triangle D E C \\
1 A E=E C \text { (given) } \\
2 \cdot B E=E D \text { (given) } \\
3 \angle A E B=\angle D E C \text { (vertically) } \\
3=90^{\circ} \text { (given) }
\end{gathered}
$$

AMT - TOP DRAWER TEACHERS
© 2013 Education Services Australia Ltd, except where indicated otherwise. This document may be used, reproduced, published, communicated and adapted free of charge for non-commercial educational purposes provided all acknowledgements associated with the material are retained.
2. In the diagram below, $\angle A B C=\angle D C B$ and $B E=E C$.

(a) Prove that $\triangle A B C$ is congruent to $\triangle D B C$.
(b) Hence prove that $\mathrm{AE}=\mathrm{ED}$.

$$
\text { a) } \begin{aligned}
\angle A B C & =\angle D B C \text { (given) } \\
B E & =E C \quad \text { (given) }
\end{aligned}
$$

$B C$ is common

$$
\therefore \triangle A B C \equiv \triangle D B C \text { (SAB) }
$$

b) $A E=D E\binom{$ matching sides of }{ congruents $\Delta^{\prime} s}$

