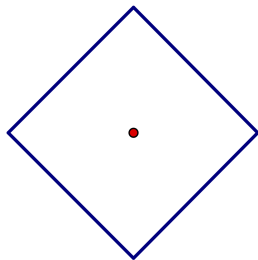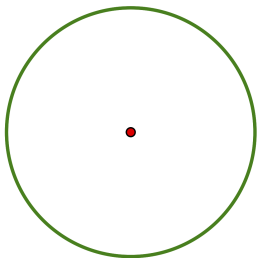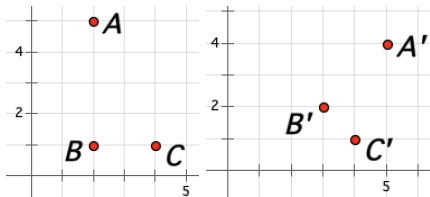## *Circles in Euclidean and Taxicab Geometry*

1. In Euclidean geometry, do 3 noncollinear points determine a unique circle? Why or why not?

2. In taxicab geometry, do 3 noncollinear points determine a unique circle? Why or why not?

SAS

$A = (2, 5), B = (2, 1), C = (4, 1)$
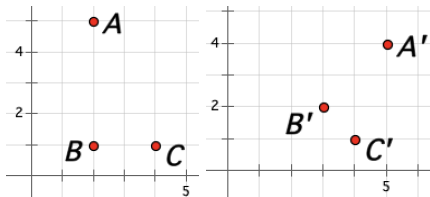$A' = (5, 4), B' = (3, 2), C' = (4, 1)$

What is $\overline{AB}, \overline{BC}, \overline{A'B'}$, and $\overline{B'C'}$ in the taxicab metric?

SAS

$A = (2, 5), B = (2, 1), C = (4, 1)$
$A' = (5, 4), B' = (3, 2), C' = (4, 1)$

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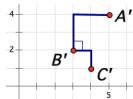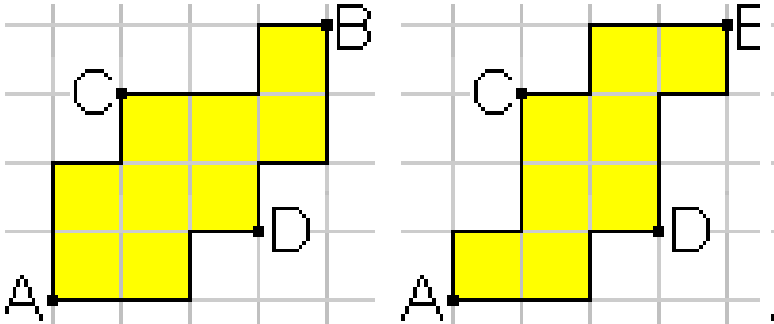
What goes wrong with the Euclidean proof of SAS?

US law is Euclidean (16/01/2006)

This is what one James Robbins found out when he stood trial for drug dealing in New York last year. US law decrees that selling drugs within 1000 feet of a school carries extra penalties. Unfortunately, Robbins had been caught within that radius, so his lawyer decided simply to change the metric. He argued that the Euclidean metric, which measures distances along straight lines between points, should be replaced by a "Taxicab metric", which measures distances along the roads a taxi, or a pedestrian, has to take to get from point to point. After all, students from the school in question are unlikely to walk through brick walls. According to this new metric, Robbins was 1254 feet away from the school: 764 feet north along Eighth Avenue and 490 feet west along 43rd Street. Alas, judge and jury were unimpressed by this mathematical trickery and Robbins lost.

Squares

http://www.mathematische-basteleien.de/taxigeometrie.htm