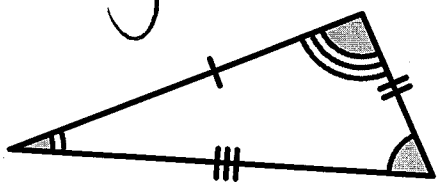
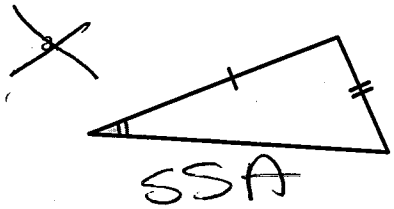
Module 6 Practice Worksheet **Name:** Answer Key

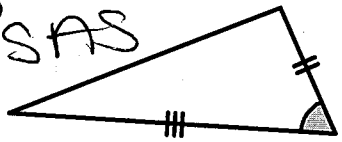
1. Which of the following triangles might *not* be congruent to the triangle to the right?



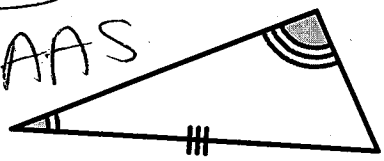
a. SSA



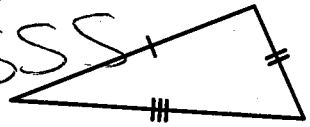
b. SAS



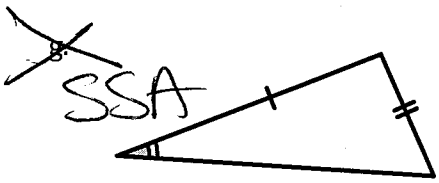
c. AAS



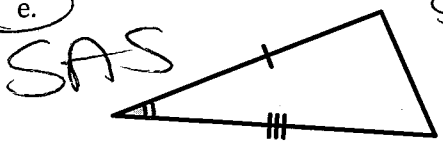
d. SSS



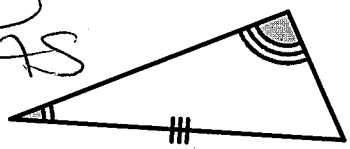
e. SSA



e. SAS

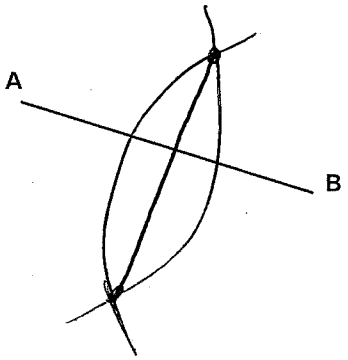


f. AAS

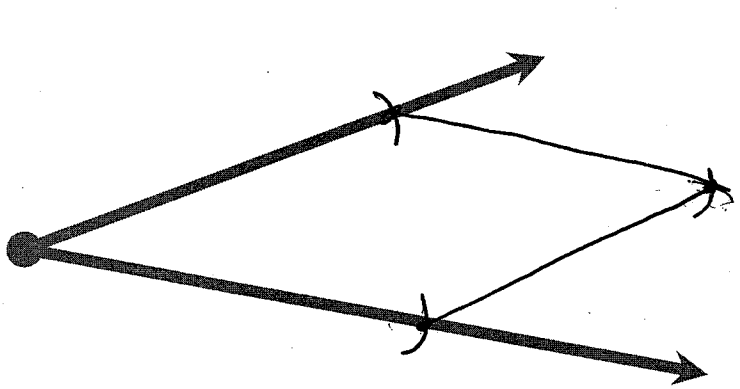


g. AAA

2. Construct a perpendicular bisector of $\overline{AB}$ using only a compass and a straight edge. Write out a numbered list with each step.

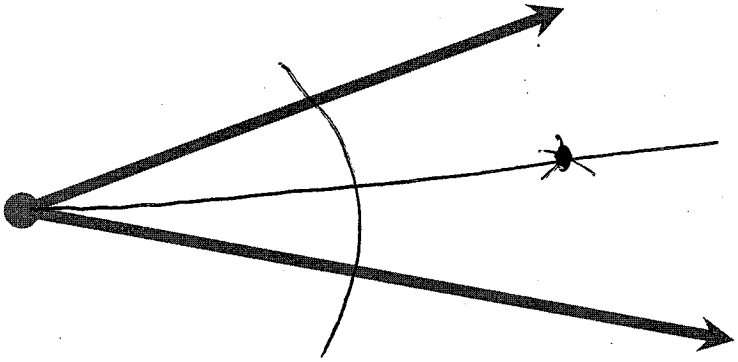


3. Construct a rhombus with the given angle and line segment using only compass and straight edge. Write out a numbered list with each step.

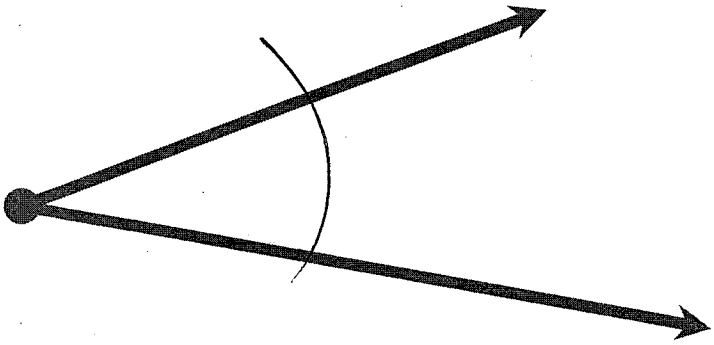


← rhombus – all sides equal

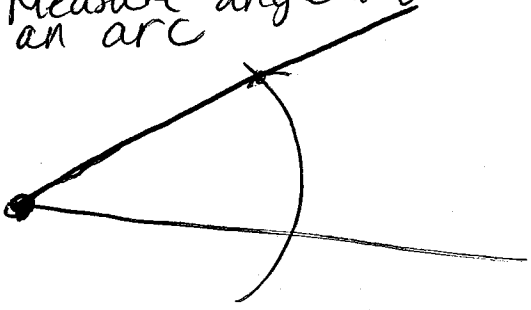
4. Construct an angle bisector for the given angle using only compass and straight edge. Write out a numbered list with each step.



5. Copy the angle below using only compass and straight edge. Write out a numbered list with each step.



① Draw a line
② Draw an arc
③ Measure angle & draw an arc



Using the diagram to match the Image/Pre-Image listed on the left with the transformation listed on the right.

c 6. Pre-image: Shape I
Image: Shape II

b 7. Pre-image: Shape II
Image: Shape III

e 8. Pre-image: Shape IV
Image: Shape II

a 9. Pre-image: Shape I
Image: Shape IV

d 10. Pre-image: Shape I
Image: Shape III

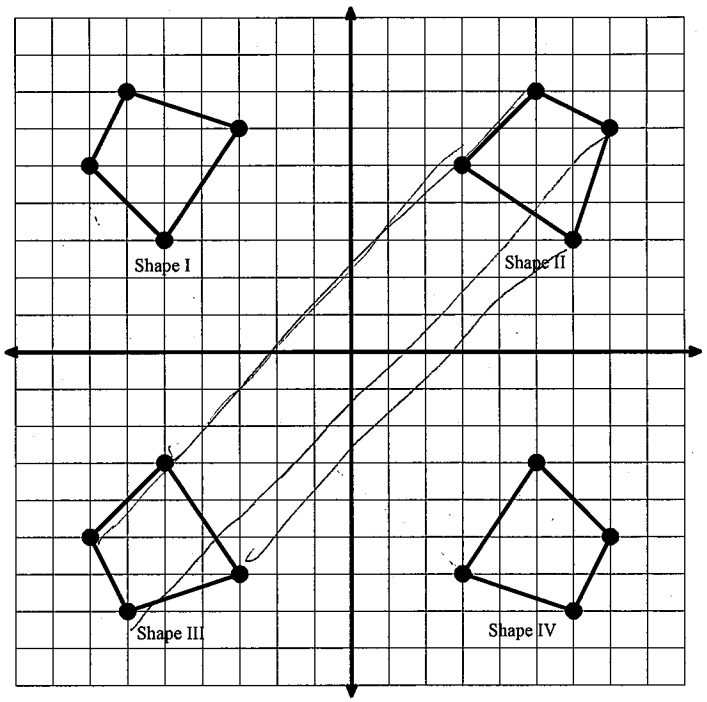
a. Rotated 180° around the point (0 , 0)

b. Reflected over the line $y = -x$

c. Rotated 270° counter-clockwise around (0 , 0)

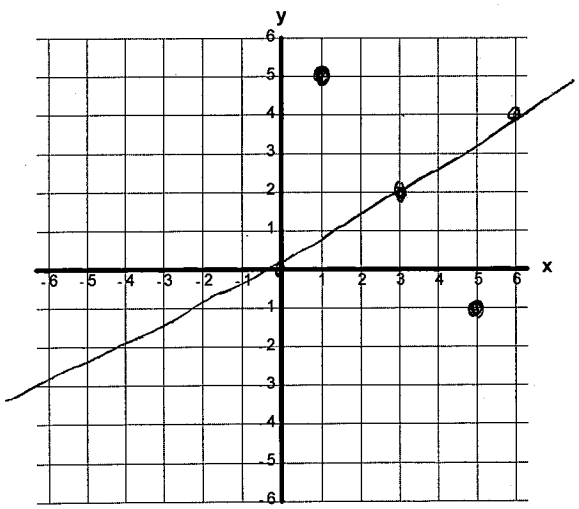
d. Reflected over the line $y = 0$

e. Rotated 90° counter-clockwise around (0 , 0)



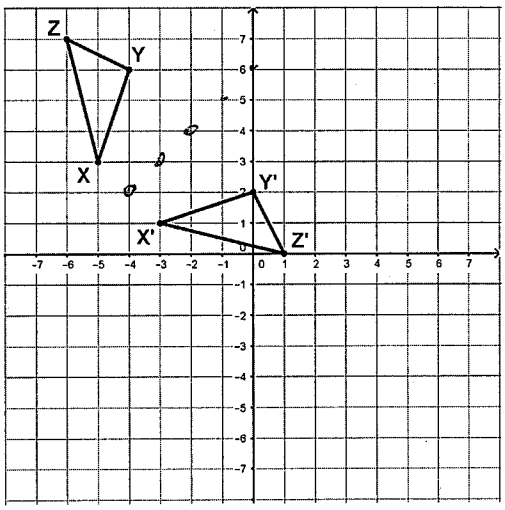
11. A(1,5) is reflected so that its image is at A'(5,-1). Graph the line of reflection on the plane below, and find the equation in slope intercept form.

y = $\frac{2}{3}x$



12. Given triangle **XYZ** and its image **X'Y'Z'** draw the line of reflection that was used.
   a. Write the equation of the line of reflection you drew.

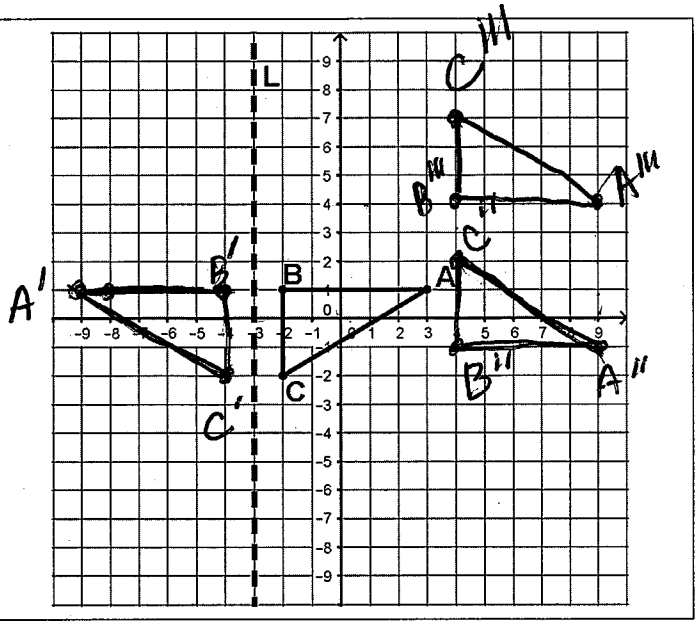
y = x + 6



13. **Pre-image:** $A(3,1), B(-2,1), C(-2,-2)$

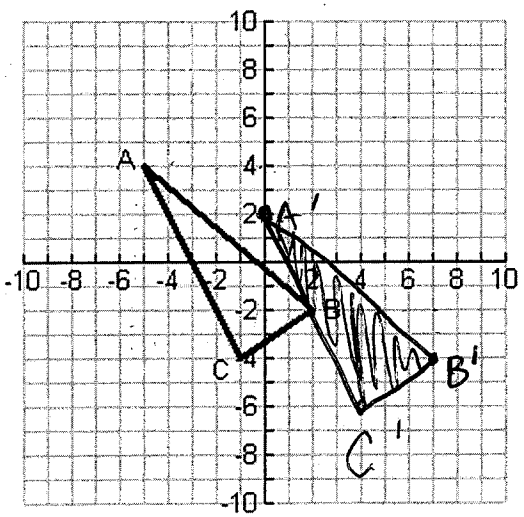
Perform the following sequence of transformations:

Reflect the image over the given line (line L), then rotate 180° around the origin, then translate up 5 units.



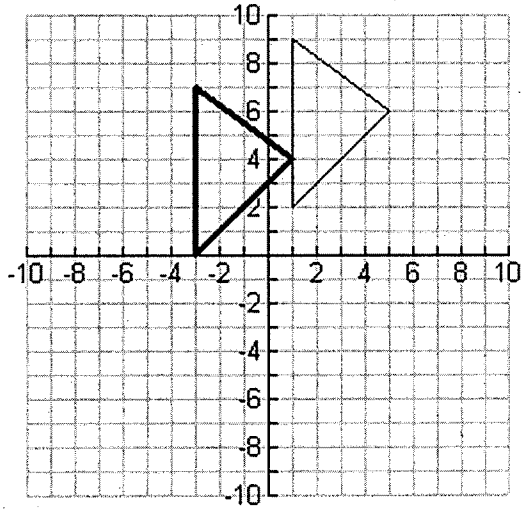
14. Translate the figure according to the given translation rule.

$(x, y) \rightarrow (x+5, y-2)$

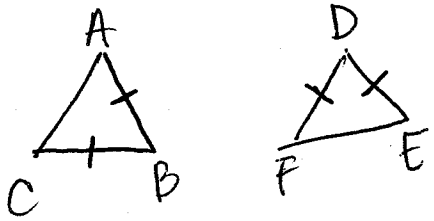


15. The bold figure is a translation of the non-bold figure. Write a rule to describe the translation.

$(x,y) \rightarrow (x-4, y-2)$

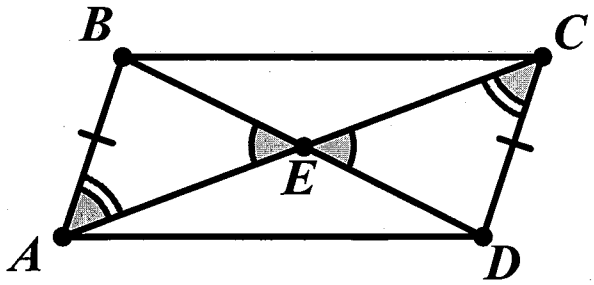


16. Consider ΔABC and ΔDEF. If $\overline{AB} \cong \overline{FD}$ and $\overline{BC} \cong \overline{DE}$, what additional information would you need to prove that the triangles are congruent by SAS?



$\angle B \cong \angle D$

17. Use the figure to the right to complete the proof.



Prove $\Delta ABE \cong \Delta DCE$

By: AAS

A . $\angle BEA \cong \angle DEC$

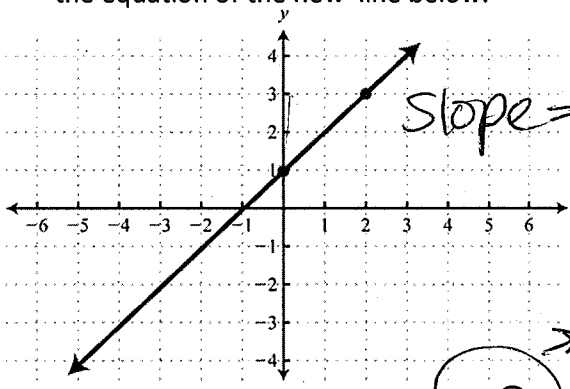
A . $\angle A \cong \angle C$

S . $\overline{AB} \cong \overline{CD}$

18. Write the equation of the line parallel to the line $y = 3x - 1$, and that has a y-intercet of 5.

$y = 3x + 5$

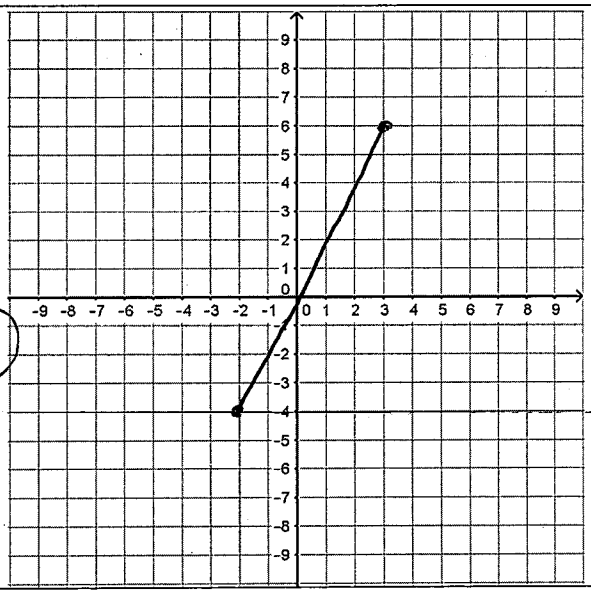
19. Draw a line perpendicular to the line given. Write the equation of the new line below.



Equation: $y = -1x + 2$ → could be anything

20. Find the slope between the pair of points. Then, using the Pythagorean Theorem, find the distance between each pair of points. You may use the graph to help you as needed. Leave all answers as reducded radicals if necessary.

(−2, −4) (3, 6)

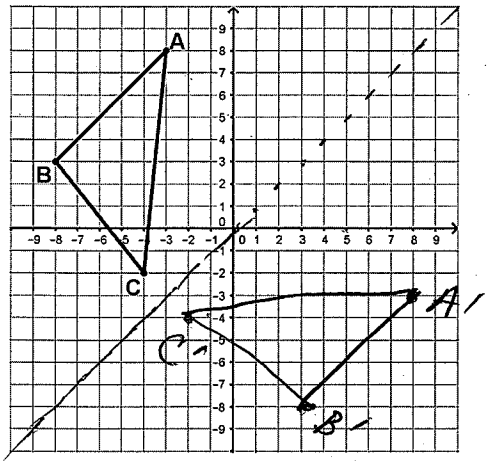


a. Slope: $\frac{6 - -4}{3 - -2} = \frac{10}{5} = 2$

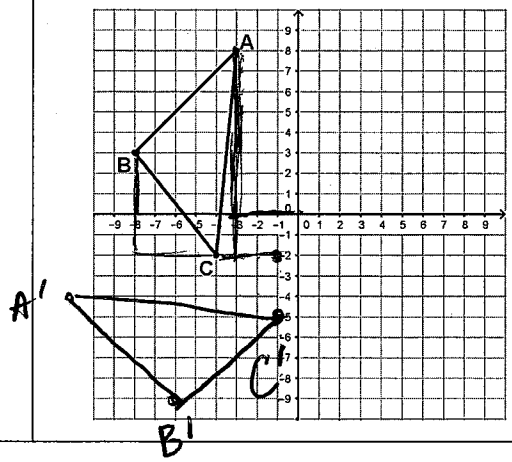
b. Distance:

$c^2 = 10^2 + 5^2 = \sqrt{125}$

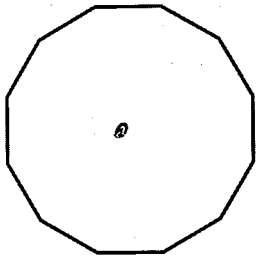
21. Reflect the triangle over the line y=x.



22. Rotate the triangle −90° clockwise, about the point (−1, −2).



23. Find the angle(s) of rotation that will carry the 12 sided polygon below onto itself.



$\frac{360}{12}$ = 30°, 60°, 90°, 120°, 150°, 180°, 210°, 240°, 270°, 300°, 330°, ~~360°~~ ← doesn't count

24. What are the angles of rotation (less than 360°) for a 20-gon? How many lines of symmetry (lines of reflection) will it have?

20 lines

$\frac{360}{20}$ = 18, 36, 54, 72, 90, 108, 126, 144, 162, 180, 198, 216, 234, 252, 270, 288, 306, 324, 342,

25. What are the angles of rotation (less than 360°) for a 15-gon? How many line of symmetry (lines of reflection) will it have?

15 lines

$\frac{360}{15}$ = 24, 48, 72, 96, 120, 144, 168, 192, 216, 240, 264, 288, 312, 336

26. How many sides does a regular polygon have that has an angle of rotation equal to 18°? Explain.

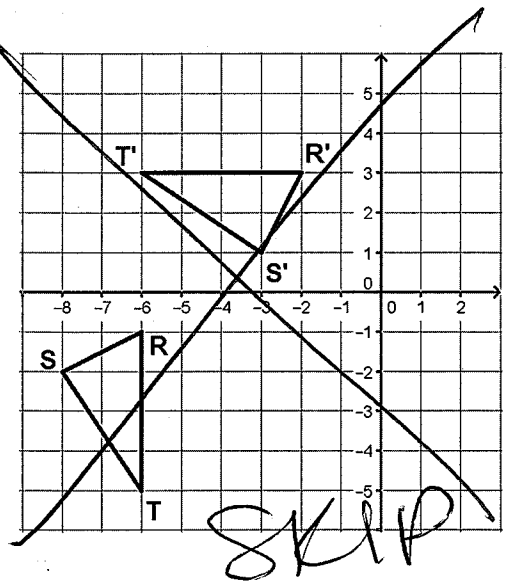
20 sides $\frac{360}{20} = 18°$

27. How many sides does a regular polygon have that has an angle of rotation equal to 20°? How many lines of symmetry will it have?

$\frac{360}{?} = 20$ 18 sides

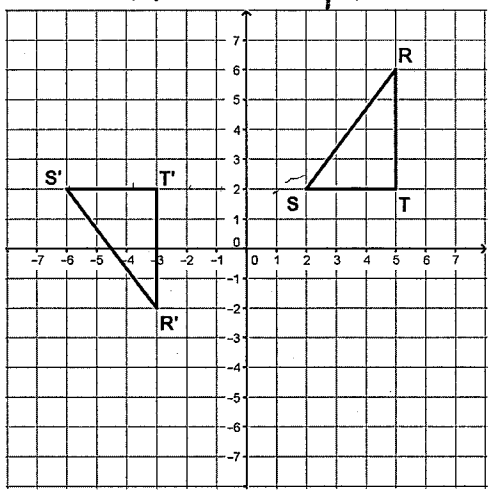
28. Find the sequence of transformations that will carry ΔRST onto $\Delta R'S'T'$. Clearly describe the sequence of transformations below each grid.

a.



SKIP

b. Translate left 8 units then reflect across $y=2$.



Determine whether or not the statement is true or false. If true, explain why. If false, explain why not or provide a counterexample.

29. If one triangle can be transformed so that one of its angles and one of its sides coincide with another triangle's angle and side then the two triangles are congruent.

No, need more info.

30. If one triangle can be transformed so that two of its sides and any one of its angles will coincide with two sides and an angle from another triangle then the two triangles will be congruent.

sometimes, but not with SSA

31. If three angles of one triangle are congruent to three angles of another triangle, then there is a sequence of transformations that will transform one triangle onto the other.

NO, AAA doesn't show congruency it shows similarity.

32. If three sides of one triangle are congruent to three sides of another triangle, then there is a sequence of transformations that will transform one triangle onto the other.

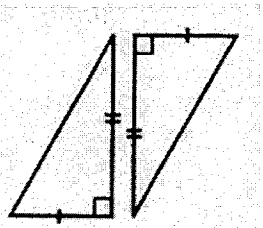
yes! SSS

33. For any two congruent polygons there is a sequence of transformations that will transform one of the polygons onto the other.

yes!

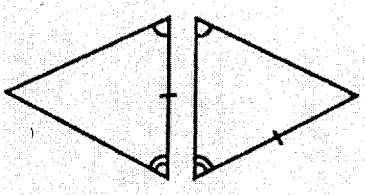
34. State whether each pair of triangles is congruent. If they are congruent, state how you know.

a.



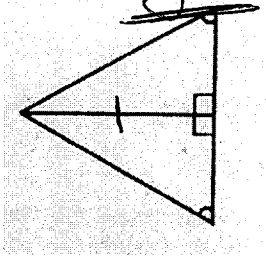
yes SAS

b.



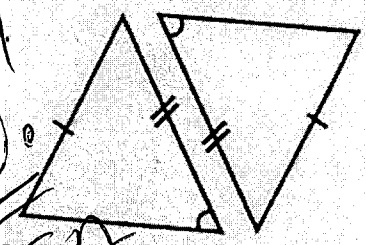
yes, ASA

c.



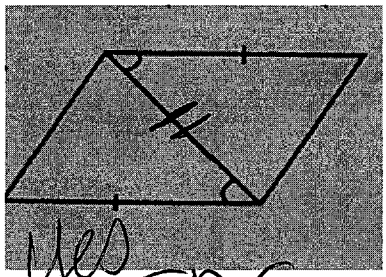
yes! AAS

d.



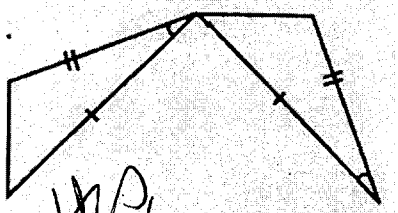
NO! SSA

e.



yes SAS

f.



yes SAS

Classify each as true or false:

35. Opposite sides of a rectangle must be parallel. TRUE

36. The sum of all interior angles of a quadrilateral add up to 330°. TRUE

37. Opposite angles in a rhomus much be equal. TRUE

38. All diagonals are lines of symmetry. FALSE

For 39-44, write the letter of *every* special quadrilateral that has the given property.

A Parallelogram B Rectangle C Rhombus

D Square E Trapezoid

39. All sides congruent. D, C

40. All angles are congruent. D, B

41. Opposite sides congruent. A, D, B, C

42. Has 90° rotational symmetry. D

43. Exactly one pair of parallel sides. E

44. Has 4 lines of symmetry. D