Name _____ Date _____

Slide, Flip, Turn: The Latest Dance Craze?

Translating, Rotating, and Reflecting Geometric Figures

Vocabulary

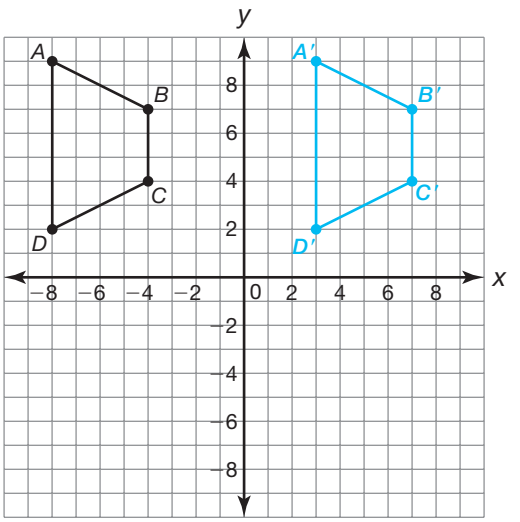
Match each definition to its corresponding term.

1. rotation	**a.** a line over which a figure is reflected so that corresponding points are the same distance from the line
2. point of rotation	**b.** the angle measure by which a geometric figure is rotated about the point of rotation
3. angle of rotation	**c.** a rigid motion that turns a figure about a fixed point for a given angle and given direction
4. reflection	**d.** a rigid motion that "flips" a figure over a given line of reflection
5. line of reflection	**e.** the fixed point about which a geometric figure is rotated during a rotation

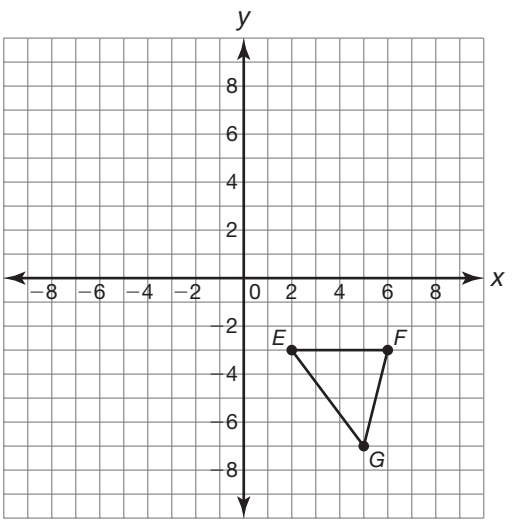
Problem Set

Transform each given geometric figure on the coordinate plane as described.

1. Translate trapezoid *ABCD* 11 units to the right.



2. Translate triangle *EFG* 8 units up.



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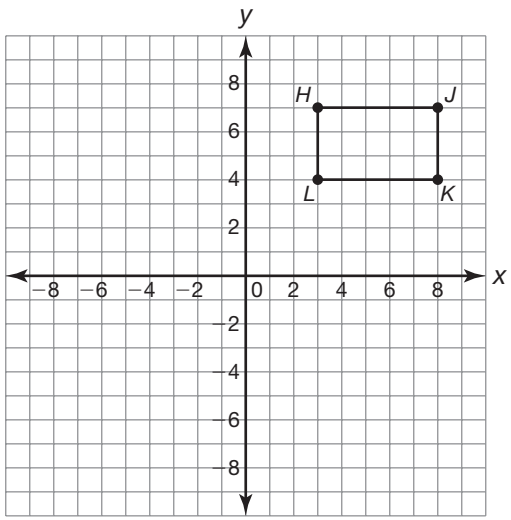
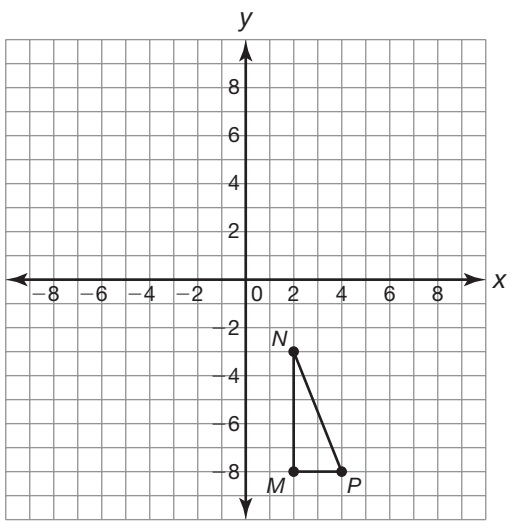
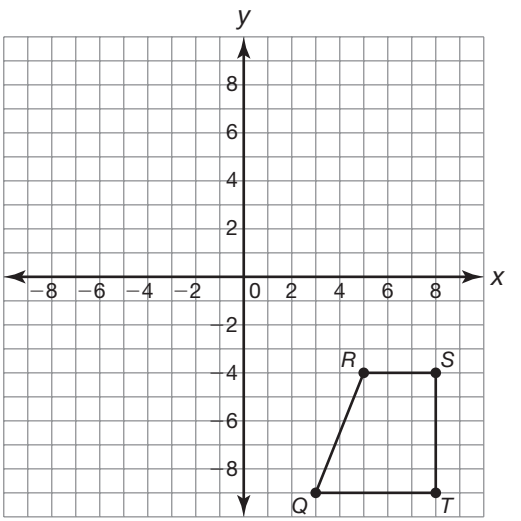
3. Rotate rectangle *HJKL* about the origin 90° counterclockwise.



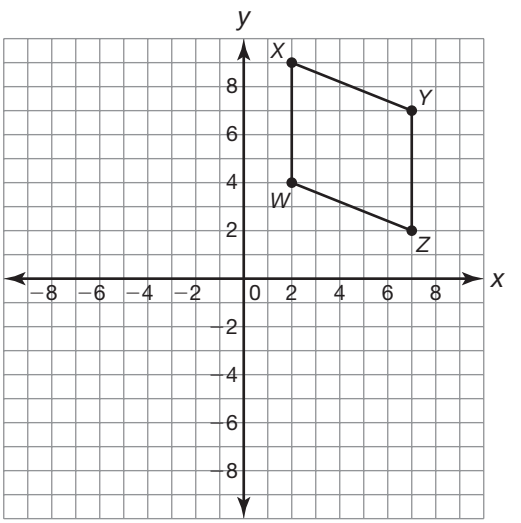
4. Rotate triangle *MNP* about the origin 180° counterclockwise.



5. Rotate trapezoid *QRST* about the origin 90° counterclockwise.



6. Rotate parallelogram *WXYZ* about the origin 180° counterclockwise.



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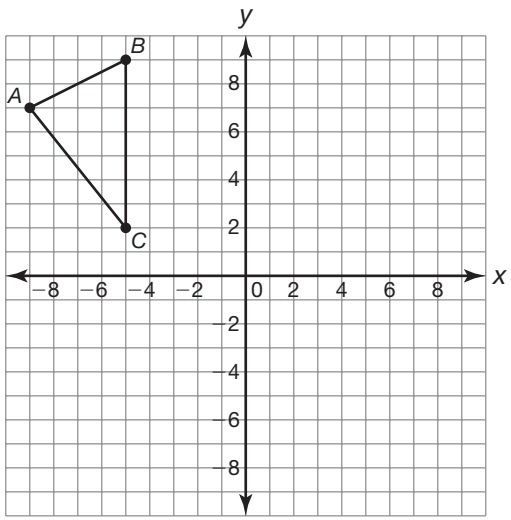
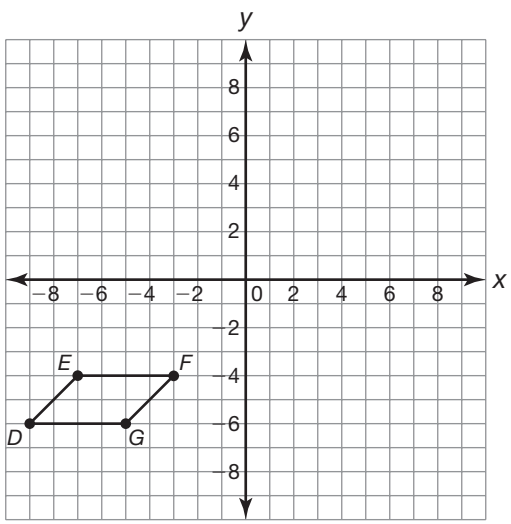
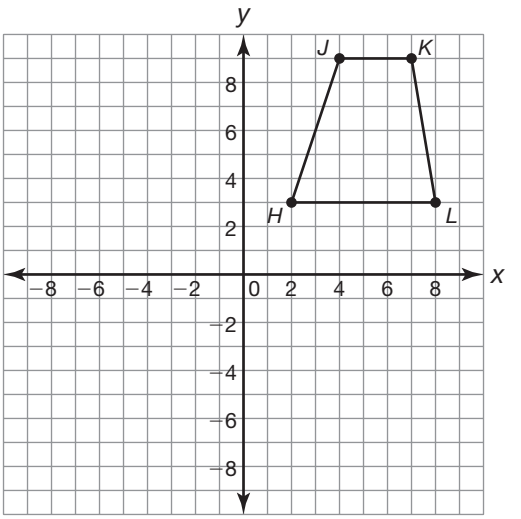
7. Reflect triangle *ABC* over the *y*-axis.



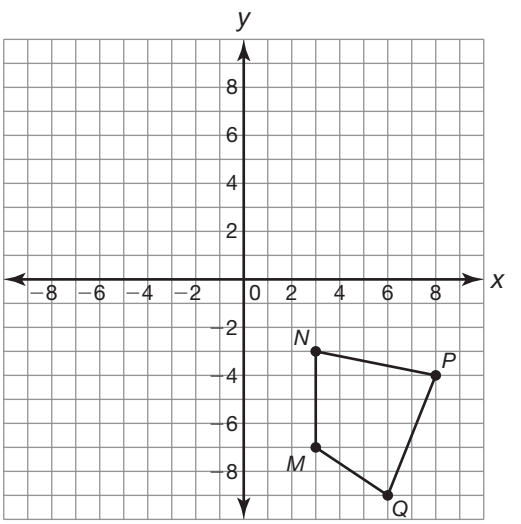
8. Reflect parallelogram *DEFG* over the *x*-axis.



9. Reflect trapezoid *HJKL* over the *x*-axis.



10. Reflect quadrilateral *MNPQ* over the *y*-axis.



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Determine the coordinates of each translated image without graphing.

11. The vertices of triangle *ABC* are *A* (5, 3), *B* (2, 8), and *C* (−4, 5). Translate the triangle 6 units to the left to form triangle *A′ B′ C′*.

The vertices of triangle *A′ B′ C′* are *A′* (−1, 3), *B′* (−4, 8), and *C′* (−10, 5).

12. The vertices of rectangle *DEFG* are *D* (−7, 1), *E* (−7, 8), *F* (1, 8), and *G* (1, 1). Translate the rectangle 10 units down to form rectangle *D′ E′ F′ G′*.

13. The vertices of parallelogram *HJKL* are *H* (2, −6), *J* (3, −1), *K* (7, −1), and *L* (6, −6). Translate the parallelogram 7 units up to form parallelogram *H′ J′ K′ L′*.

14. The vertices of trapezoid *MNPQ* are *M* (−6, −5), *N* (0, −5), *P* (−1, 2), and *Q* (−4, 2). Translate the trapezoid 4 units to the right to form trapezoid *M′ N′ P′ Q′*.

15. The vertices of triangle *RST* are *R* (0, 3), *S* (2, 7), and *T* (3, −1). Translate the triangle 5 units to the left and 3 units up to form triangle *R′ S′ T′*.

16. The vertices of quadrilateral *WXYZ* are *W* (−10, 8), *X* (−2, −1), *Y* (0, 0), and *Z* (3, 7). Translate the quadrilateral 5 units to the right and 8 units down to form quadrilateral *W′ X′ Y′ Z′*.

Determine the coordinates of each rotated image without graphing.

17. The vertices of triangle *ABC* are *A* (5, 3), *B* (2, 8), and *C* (−4, 5). Rotate the triangle about the origin 90° counterclockwise to form triangle *A′ B′ C′*.

The vertices of triangle *A′ B′ C′* are *A′* (−3, 5), *B′* (−8, 2), and *C′* (−5, −4).

18. The vertices of rectangle *DEFG* are *D* (−7, 1), *E* (−7, 8), *F* (1, 8), and *G* (1, 1). Rotate the rectangle about the origin 180° counterclockwise to form rectangle *D′ E′ F′ G′*.

19. The vertices of parallelogram *HJKL* are *H* (2, −6), *J* (3, −1), *K* (7, −1), and *L* (6, −6). Rotate the parallelogram about the origin 90° counterclockwise to form parallelogram *H′ J′ K′ L′*.

20. The vertices of trapezoid *MNPQ* are *M* (−6, −5), *N* (0, −5), *P* (−1, 2), and *Q* (−4, 2). Rotate the trapezoid about the origin 180° counterclockwise to form trapezoid *M′ N′ P′ Q′*.

21. The vertices of triangle *RST* are *R* (0, 3), *S* (2, 7), and *T* (3, −1). Rotate the triangle about the origin 90° counterclockwise to form triangle *R′ S′ T′*.

22. The vertices of quadrilateral *WXYZ* are *W* (−10, 8), *X* (−2, −1), *Y* (0, 0), and *Z* (3, 7). Rotate the quadrilateral about the origin 180° counterclockwise to form quadrilateral *W′ X′ Y′ Z′*.

Determine the coordinates of each reflected image without graphing.

23. The vertices of triangle *ABC* are *A* (5, 3), *B* (2, 8), and *C* (−4, 5). Reflect the triangle over the *x*-axis to form triangle *A′ B′ C′*.

The vertices of triangle *A′ B′ C′* are *A′* (5, −3), *B′* (2, −8), and *C′* (−4, −5).

24. The vertices of rectangle *DEFG* are *D* (−7, 1), *E* (−7, 8), *F* (1, 8), and *G* (1, 1). Reflect the rectangle over the *y*-axis to form rectangle *D′ E′ F′ G′*.

25. The vertices of parallelogram *HJKL* are *H* (2, −6), *J* (3, −1), *K* (7, −1), and *L* (6, −6). Reflect the parallelogram over the *x*-axis to form parallelogram *H′ J′ K′ L′*.

26. The vertices of trapezoid *MNPQ* are *M* (−6, −5), *N* (0, −5), P (−1, 2), and *Q* (−4, 2). Reflect the trapezoid over the *y*-axis to form trapezoid *M′ N′ P′ Q′*.

27. The vertices of triangle *RST* are *R* (0, 3), *S* (2, 7), and *T* (3, −1). Reflect the triangle over the *x*-axis to form triangle *R′ S′ T′*.

28. The vertices of quadrilateral *WXYZ* are *W* (−10, 8), *X* (−2, −1), *Y* (0, 0), and *Z* (3, 7). Reflect the quadrilateral over the *y*-axis to form quadrilateral *W′ X′ Y′ Z′*.

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All the Same to You
Congruent Triangles

Vocabulary

Complete each problem related to the key terms of the lesson.

1. Draw and label a pair of congruent triangles. Write a congruence statement for the triangles.

a. Identify each pair of congruent line segments in the drawing.

b. Identify each pair of congruent angles in the drawing.

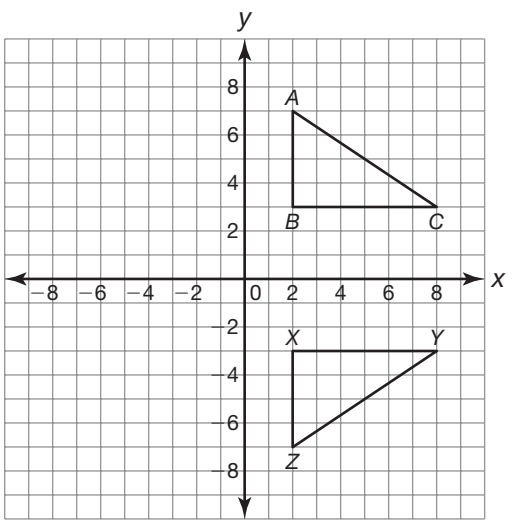
c. Identify each pair of corresponding sides in the drawing.

d. Identify each pair of corresponding angles in the drawing.

Problem Set

Identify the transformation used to create $\triangle XYZ$ on each coordinate plane. Identify the congruent angles and the congruent sides. Then write a triangle congruence statement.

1.

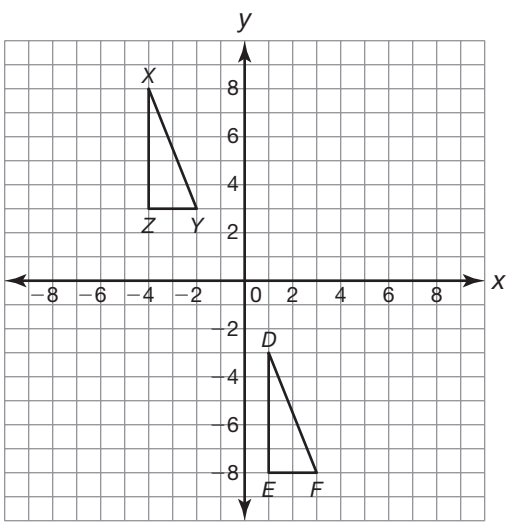


Triangle *BCA* was reflected over the *x*-axis to create triangle *XYZ*.

$BC \cong \overline{XY}$, $\overline{CA} \cong \overline{YZ}$, and $\overline{BA} \cong \overline{XZ}$; $\angle B \cong \angle X$, $\angle C \cong \angle Y$, and $\angle A \cong \angle Z$.

$\triangle BCA \cong \triangle XYZ$

2.



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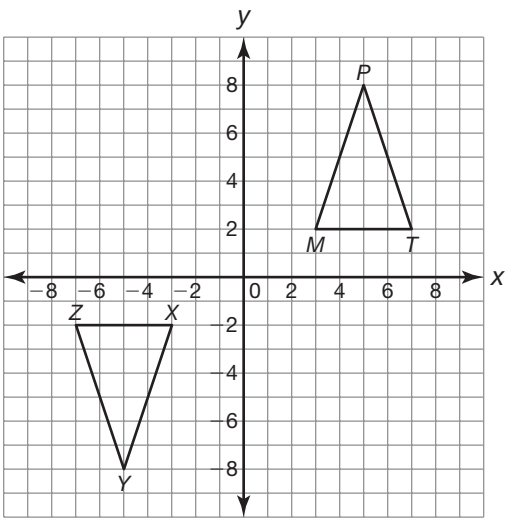
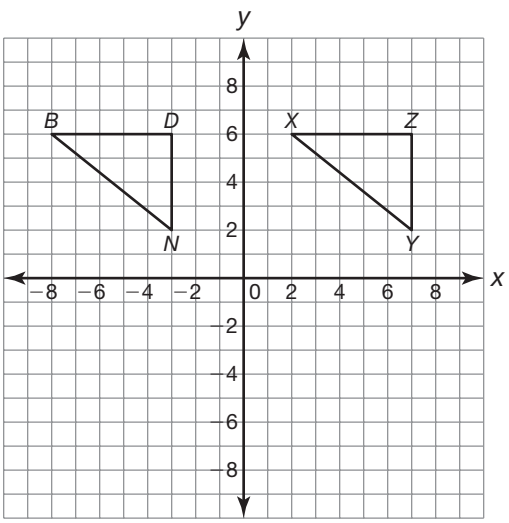
3.



4.



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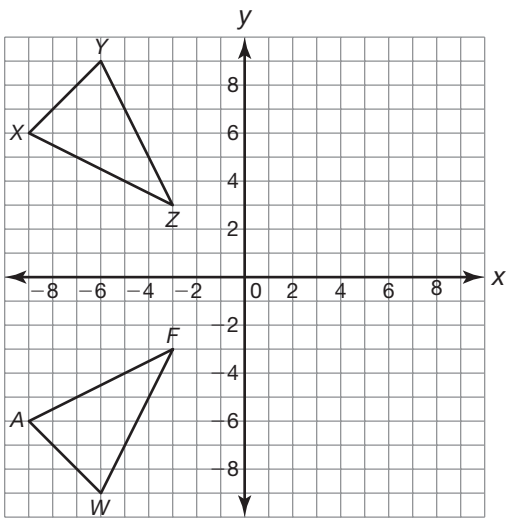

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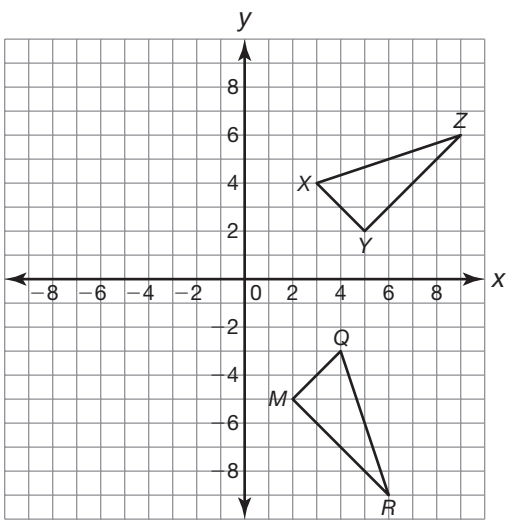

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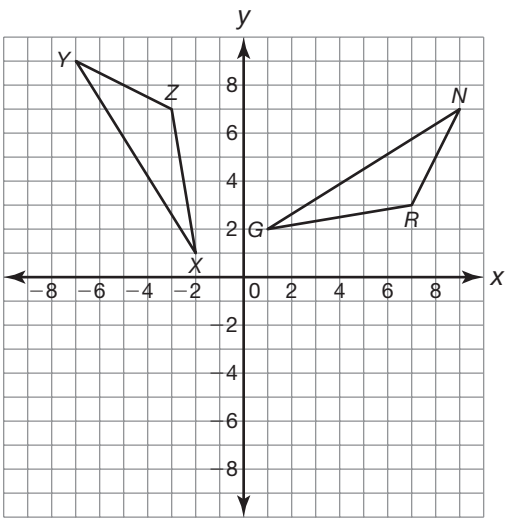
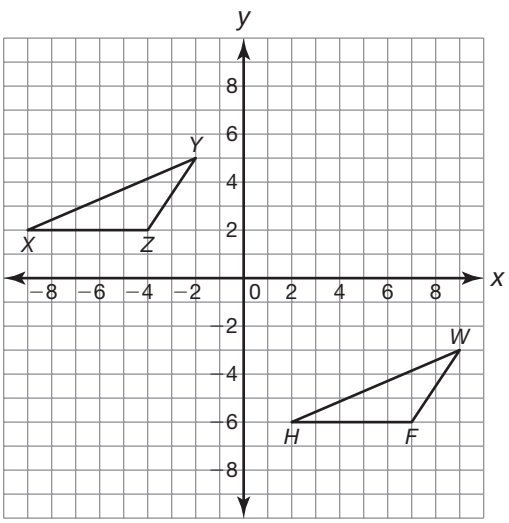
7.



8.



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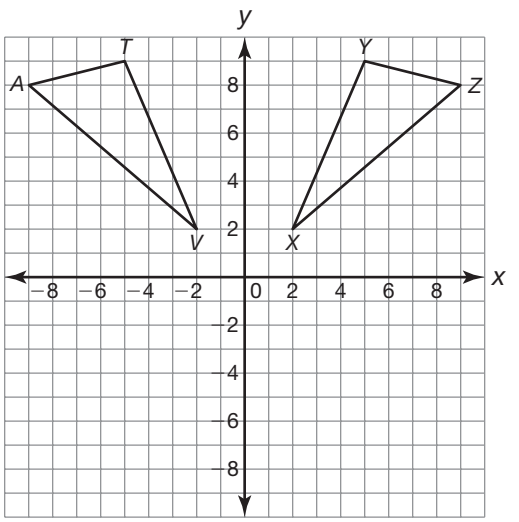
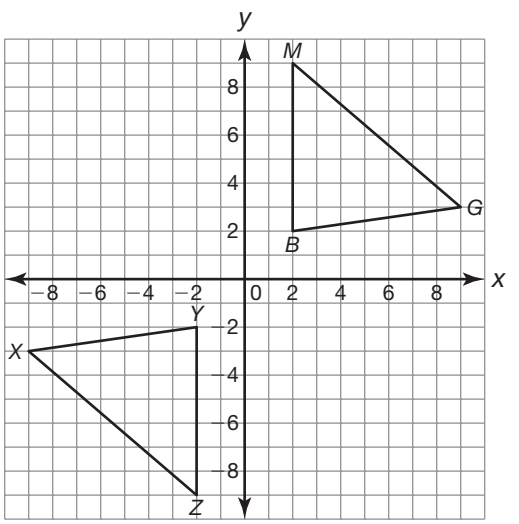


10.



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List the corresponding sides and angles using congruence symbols for each pair of triangles represented by the given congruence statement.

11. $\triangle JPM \cong \triangle TRW$

$\overline{JP} \cong \overline{TR}$, $\overline{PM} \cong \overline{RW}$, and $\overline{JM} \cong \overline{TW}$; $\angle J \cong \angle T$, $\angle P \cong \angle R$, and $\angle M \cong \angle W$.

12. $\triangle AEU \cong \triangle BCD$

13. $\triangle LUV \cong \triangle MTH$

14. $\triangle RWB \cong \triangle VCQ$

15. $\triangle TOM \cong \triangle BEN$

16. $\triangle JKL \cong \triangle RST$

17. $\triangle CAT \cong \triangle SUP$

18. $\triangle TOP \cong \triangle GUN$

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Side-Side-Side
SSS Congruence Theorem

Vocabulary

Define each term in your own words.

1. theorem

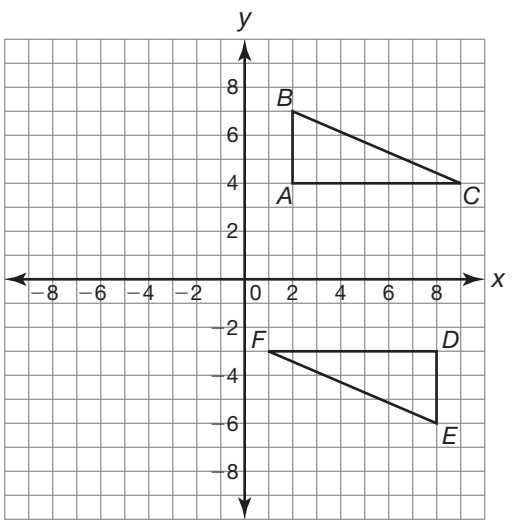
2. postulate

3. Side-Side-Side (SSS) Congruence Theorem

Problem Set

Determine whether each pair of given triangles are congruent by SSS. Use the Distance Formula when necessary.

1.



$AB = DE = 3$

$AC = DF = 7$

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$BC = \sqrt{(9 - 2)^2 + (4 - 7)^2}$

$BC = \sqrt{7^2 + (-3)^2}$

$BC = \sqrt{49 + 9}$

$BC = \sqrt{58} \approx 7.62$

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$EF = \sqrt{(1 - 8)^2 + (-3 - (-6))^2}$

$EF = \sqrt{(-7)^2 + 3^2}$

$EF = \sqrt{49 + 9}$

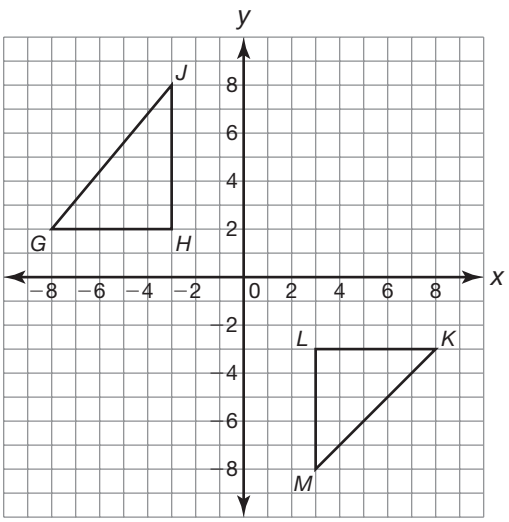
$EF = \sqrt{58} \approx 7.62$

$BC = EF$

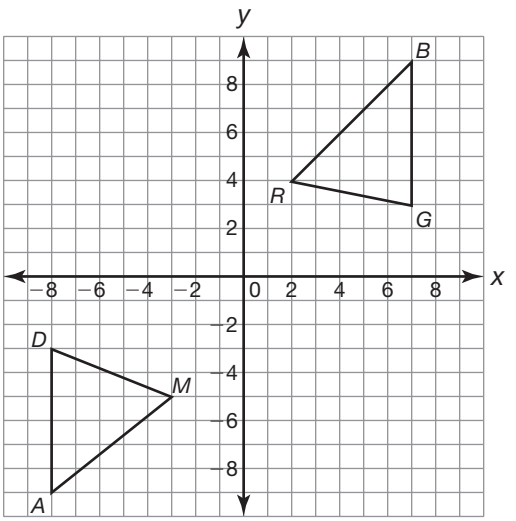
The triangles are congruent by the SSS Congruence Theorem.

Name _____ Date _____

2.



3.



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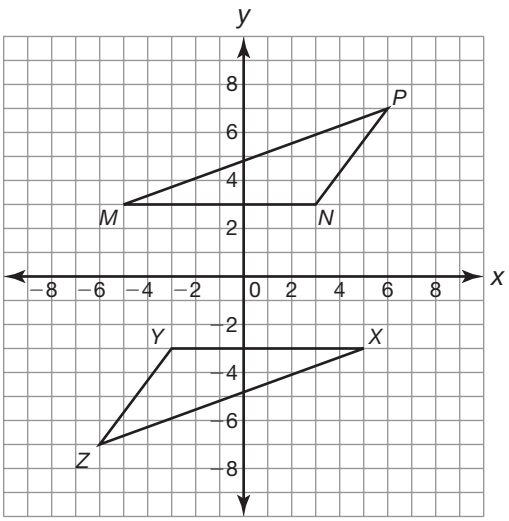
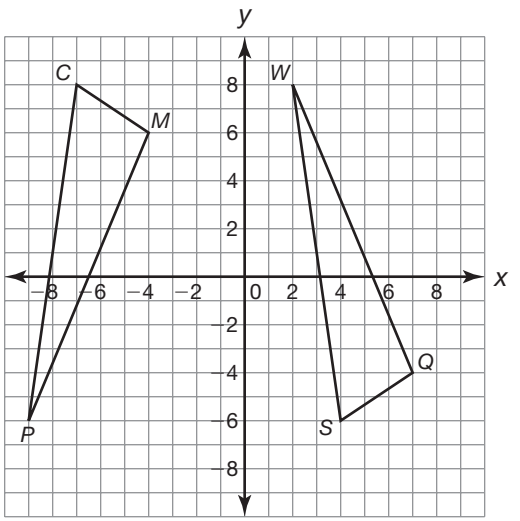
4.



5.



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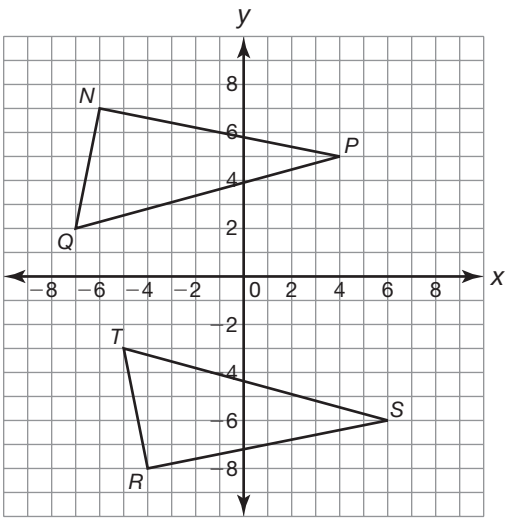
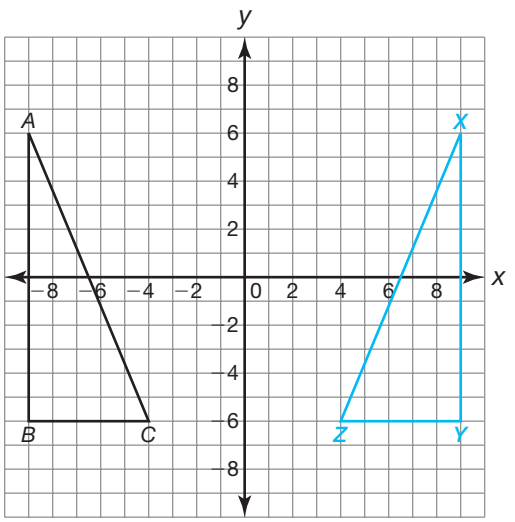
6.



Perform the transformation described on each given triangle. Then verify that the triangles are congruent by SSS. Use the Distance Formula when necessary.

7. Reflect $\triangle ABC$ over the y-axis to form $\triangle XYZ$. Verify that $\triangle ABC \cong \triangle ABC$ by SSS.



$AB = XY = 12$

$BC = YZ = 5$

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$AC = \sqrt{(-4 - (-9))^2 + (-6 - 6)^2}$

$AC = \sqrt{5^2 + (-12)^2}$

$AC = \sqrt{25 + 144}$

$AC = \sqrt{169} = 13$

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$XZ = \sqrt{(4 - 9)^2 + (-6 - 6)^2}$

$XZ = \sqrt{(-5)^2 + (-12)^2}$

$XZ = \sqrt{25 + 144}$

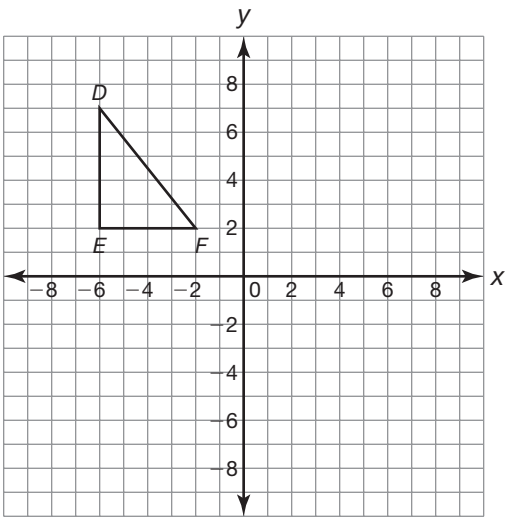
$XZ = \sqrt{169} = 13$

$AC = XZ$

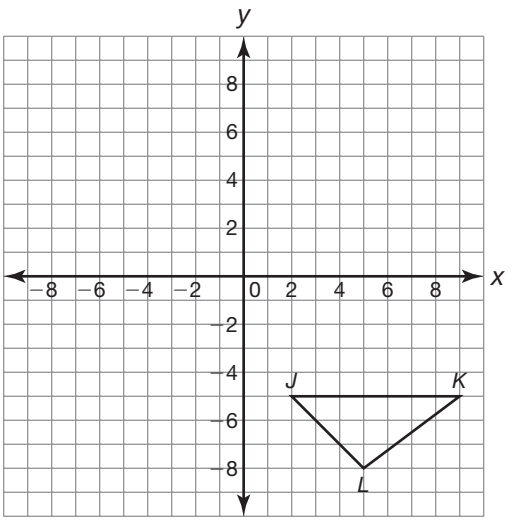
The triangles are congruent by the SSS Congruence Theorem.

Name _____ Date _____

8. Rotate $\triangle DEF$ 180° clockwise to form $\triangle QRS$. Verify that $\triangle DEF \cong \triangle QRS$ by SSS.



9. Reflect $\triangle JKL$ over the x-axis to form $\triangle MNP$. Verify that $\triangle JKL \cong \triangle MNP$ by SSS.



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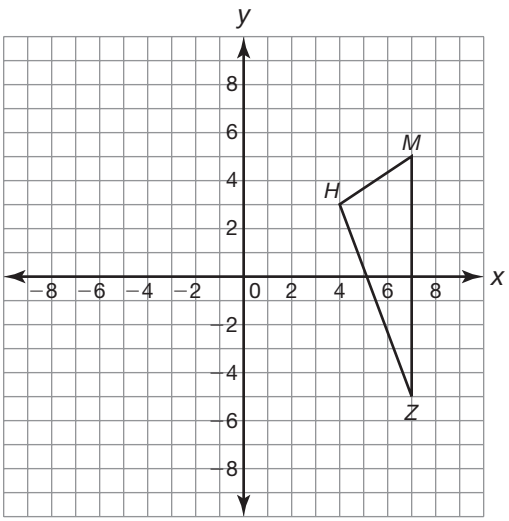
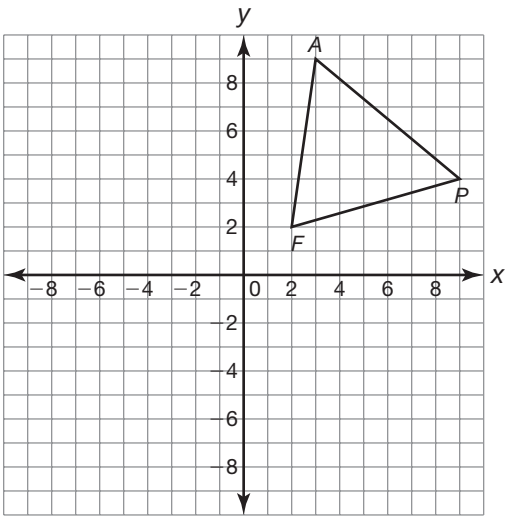
10. Translate $\triangle HMZ$ 10 units to the left and 1 unit down to form $\triangle BNY$. Verify that $\triangle HMZ \cong \triangle BNY$ by SSS.



11. Rotate $\triangle AFP$ 90° counterclockwise to form $\triangle DHW$. Verify that $\triangle AFP \cong \triangle DHW$ by SSS.



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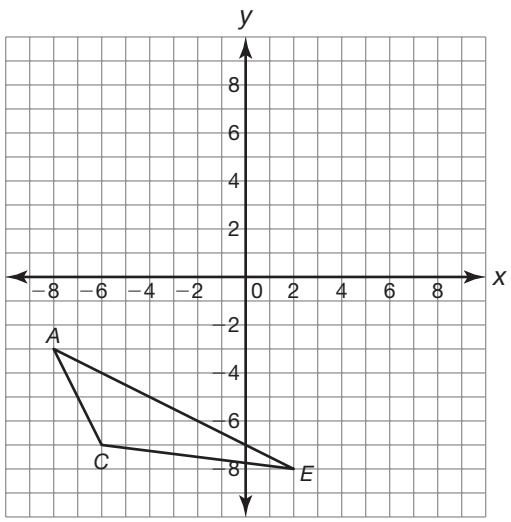
12. Translate $\triangle ACE$ 3 units to the right and 9 units up to form $\triangle JKQ$. Verify that $\triangle ACE \cong \triangle JKQ$ by SSS.



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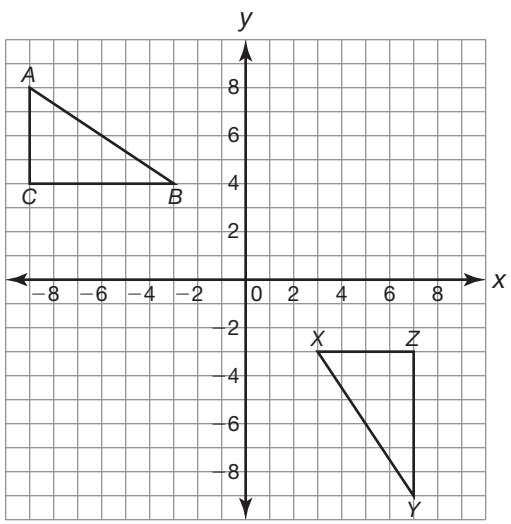
Side-Angle-Side
SAS Congruence Theorem

Vocabulary

Describe how to prove the given triangles are congruent. Use the key terms *included angle* and *Side-Angle-Side Congruence Theorem* in your answer.

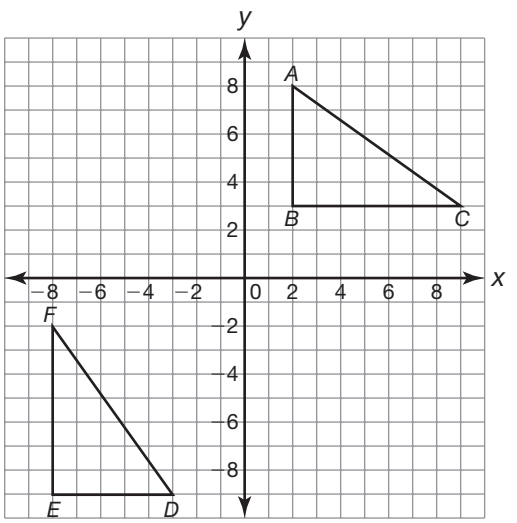
1.



Problem Set

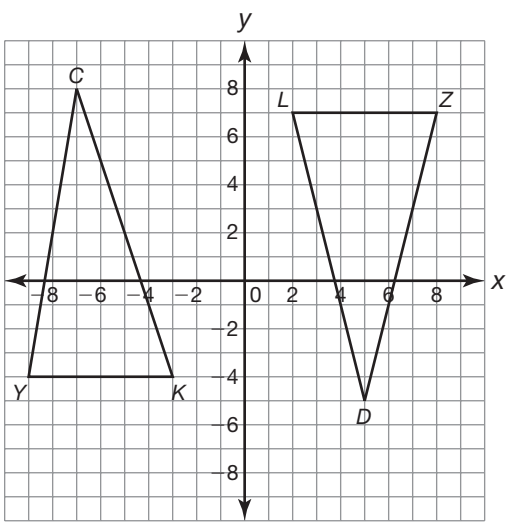
Determine whether each pair of given triangles are congruent by SAS. Use the Distance Formula when necessary.

1. Determine whether $\triangle ABC$ is congruent to $\triangle DEF$ by SAS.



$AB = DE = 5$
$BC = EF = 7$
$m\angle B = m\angle E = 90°$
The triangles are congruent by the SAS Congruence Theorem.

2. Determine whether $\triangle CKY$ is congruent to $\triangle DLZ$ by SAS.



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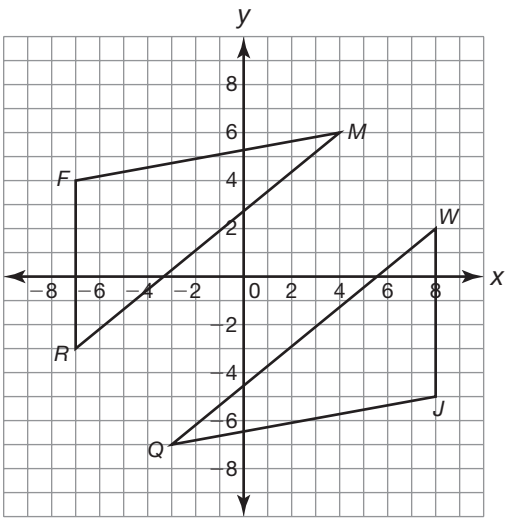
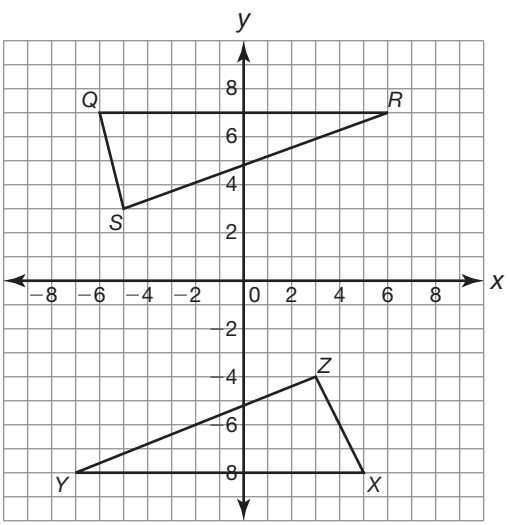
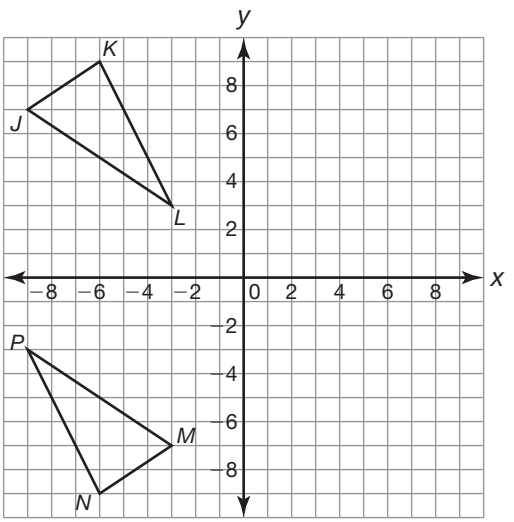
3. Determine whether $\triangle FMR$ is congruent to $\triangle JQW$ by SAS.



4. Determine whether $\triangle QRS$ is congruent to $\triangle XYZ$ by SAS.

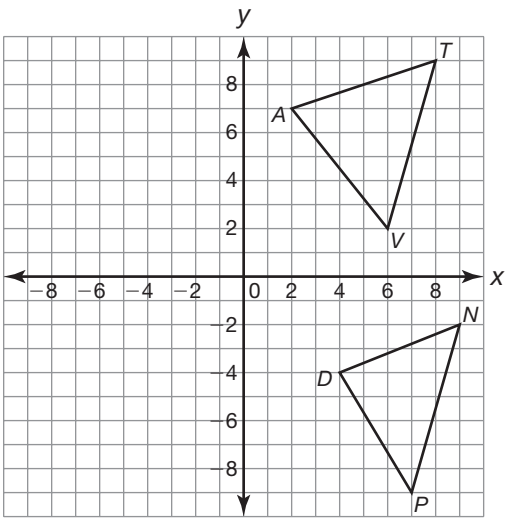


5. Determine whether $\triangle JKL$ is congruent to $\triangle MNP$ by SAS.



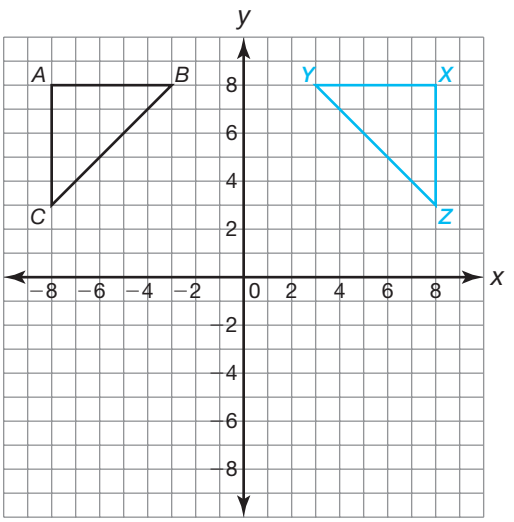
Name _____ Date _____

6. Determine whether $\triangle ATV$ is congruent to $\triangle DNP$ by SAS.



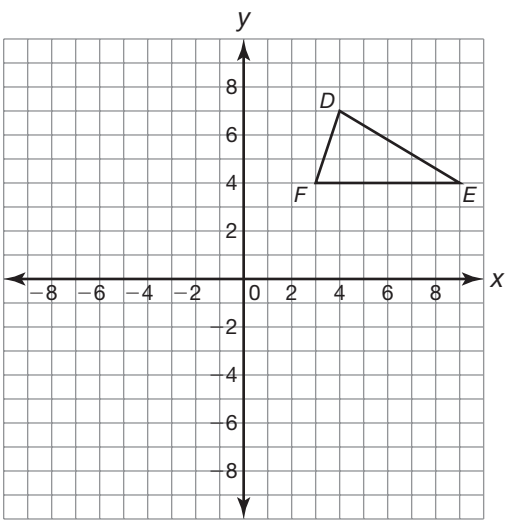
Perform the transformation described on each given triangle. Then verify that the triangles are congruent by SAS. Use the Distance Formula when necessary.

7. Reflect $\triangle ABC$ over the y-axis to form $\triangle XYZ$. Verify that $\triangle ABC \cong \triangle XYZ$ by SAS.



$AB = XY = 5$
$AC = XZ = 5$
$m\angle A = m\angle X = 90°$
The triangles are congruent by the SAS Congruence Theorem.

8. Translate $\triangle DEF$ 11 units to the left and 10 units down to form $\triangle QRS$. Verify that $\triangle DEF \cong \triangle QRS$ by SAS.



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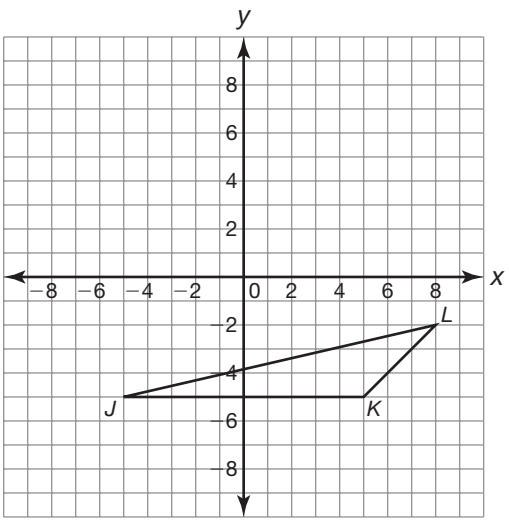
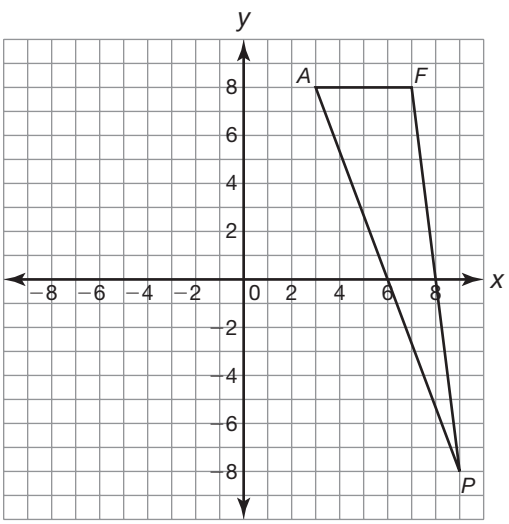
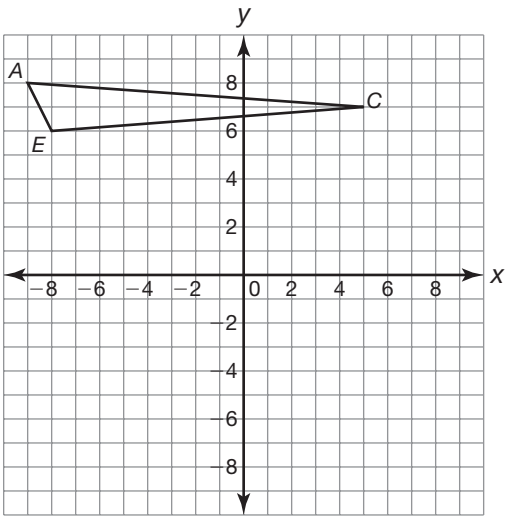
9. Rotate △*JKL* 180° counterclockwise to form △*MNP*. Verify that △*JKL* ≅ △*MNP* by SAS.



10. Reflect △*AFP* over the *y*-axis to form △*DHW*. Verify that △*AFP* ≅ △*DHW* by SAS.

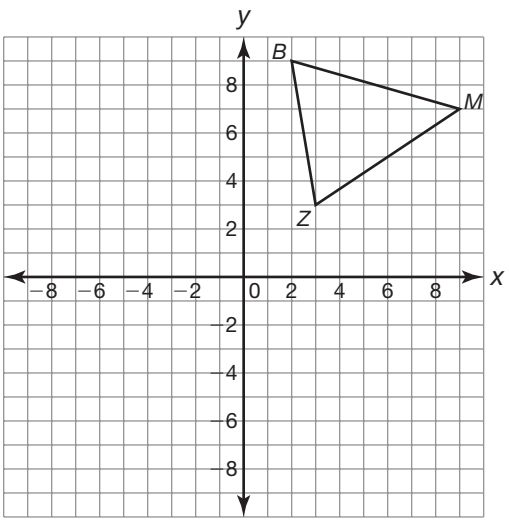


11. Translate $\triangle ACE$ 4 units to the right and 4 units down to form $\triangle JKQ$. Verify that $\triangle ACE \cong \triangle JKQ$ by SAS.



Name _____ Date _____

12. Rotate $\triangle BMZ$ 90° counterclockwise to form $\triangle DRT$. Verify that $\triangle BMZ \cong \triangle DRT$ by SAS.



Determine the angle measure or side measure that is needed in order to prove that each set of triangles are congruent by SAS.

13. In $\triangle ART$, $AR = 12$, $RT = 8$, and $m\angle R = 70°$. In $\triangle BSW$, $BS = 12$ and $m\angle S = 70°$.

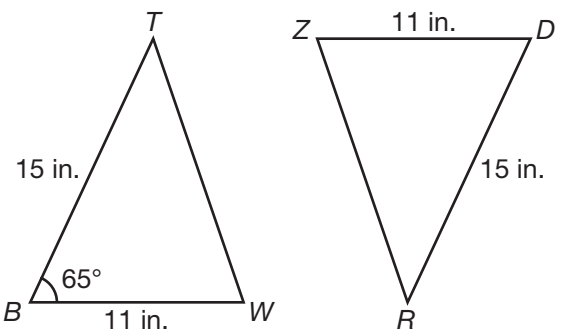
SW = 8

14. In $\triangle CDE$, $CD = 7$, $DE = 11$, In $\triangle FGH$, $FG = 7$, $GH = 11$ and $m\angle G = 45°$.

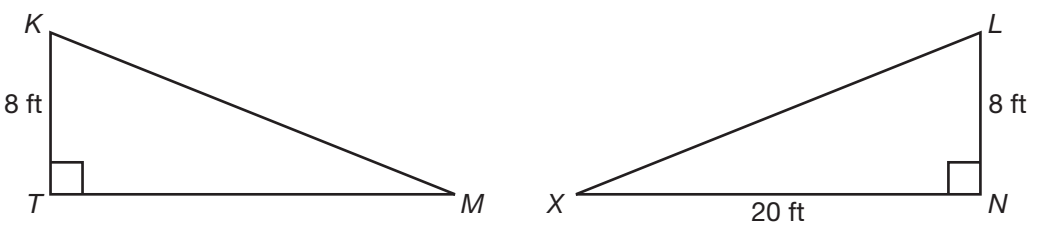
15. In $\triangle JKL$, $JK = 2$, $KL = 3$, and $m\angle K = 60°$. In $\triangle MNP$, $NP = 3$ and $m\angle N = 60°$.

16. In $\triangle QRS$, $QS = 6$, $RS = 4$, and $m\angle S = 20°$. In $\triangle TUV$, $TV = 6$ and $UV = 4$.

17.



18.



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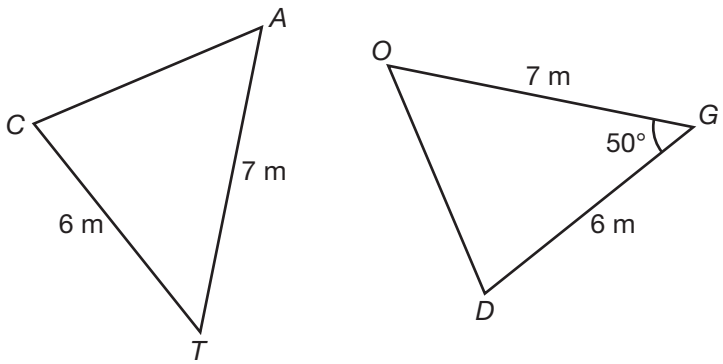
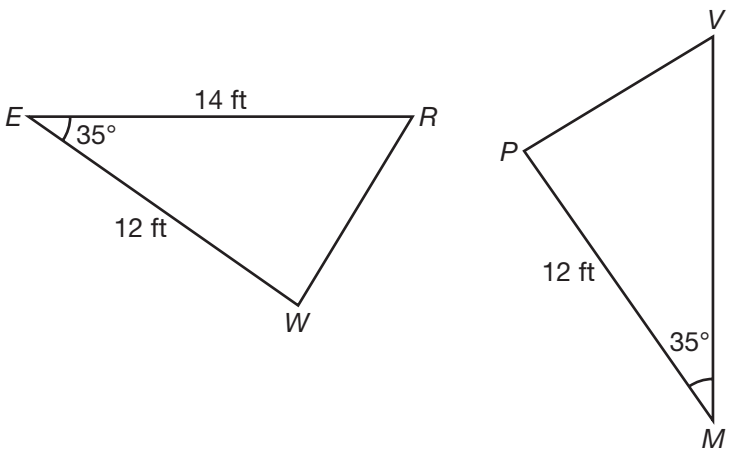
19.

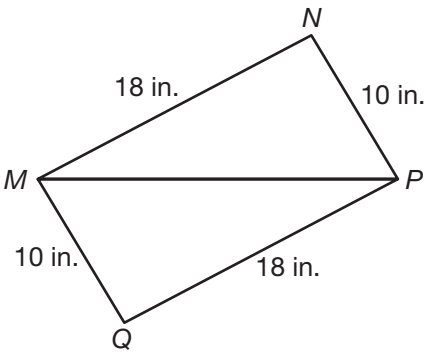


20.



Determine whether there is enough information to prove that each pair of triangles are congruent by SSS or SAS. Write the congruence statements to justify your reasoning.

21. $\triangle MNP \stackrel{?}{\cong} \triangle PQM$



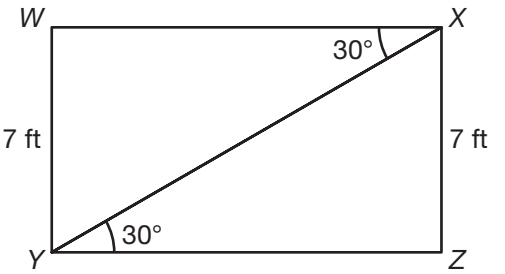
The triangles are congruent by SSS.

$\overline{MN} \cong \overline{PQ}$

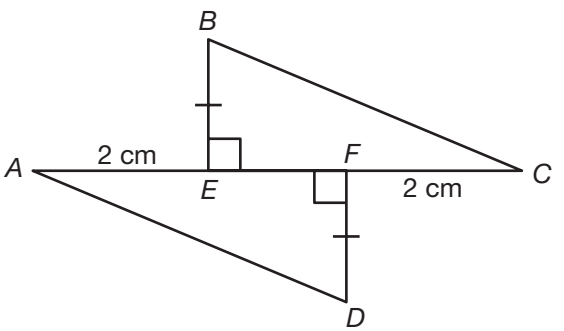
$\overline{NP} \cong \overline{QM}$

$\overline{MP} \cong \overline{PM}$

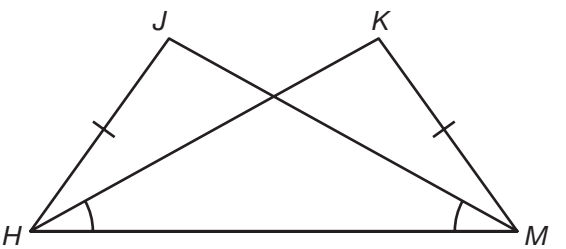
22. $\triangle WXY \stackrel{?}{\cong} \triangle ZYX$



23. $\triangle BCE \stackrel{?}{\cong} \triangle DAF$



24. $\triangle HJM \stackrel{?}{\cong} \triangle MKH$



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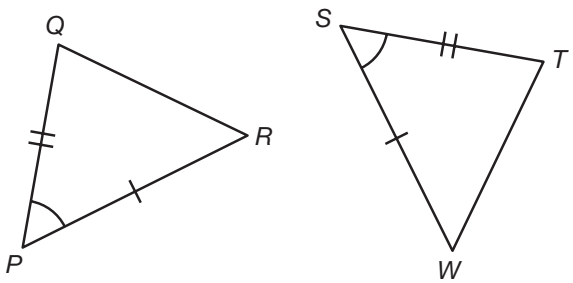
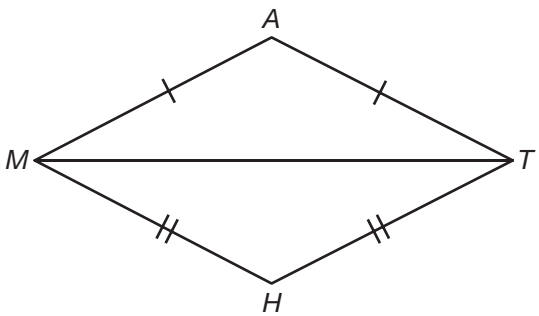
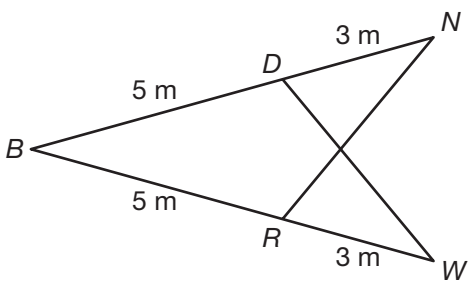
25. $\triangle PQR \stackrel{?}{\cong} \triangle STW$



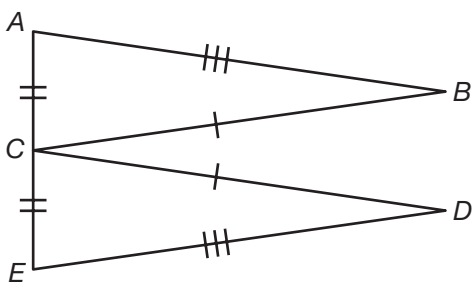
26. $\triangle MAT \stackrel{?}{\cong} \triangle MHT$



27. $\triangle BDW \stackrel{?}{\cong} \triangle BRN$



28. $\triangle ABC \stackrel{?}{\cong} \triangle EDC$



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Name _____ Date _____

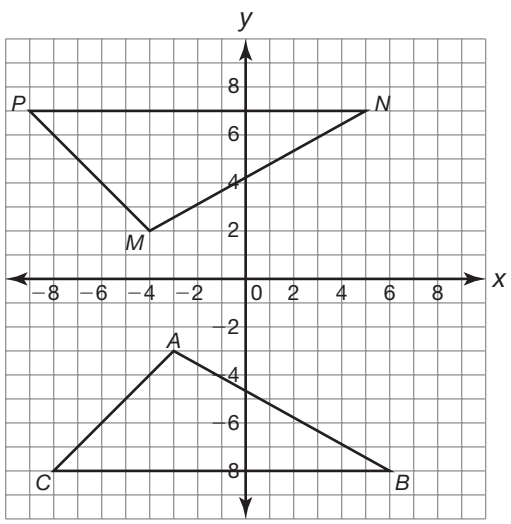
You Shouldn't Make Assumptions

Angle-Side-Angle Congruence Theorem

Vocabulary

Describe how to prove the given triangles are congruent. Use the key terms *included side* and *Angle-Side-Angle Congruence Theorem* in your answer.

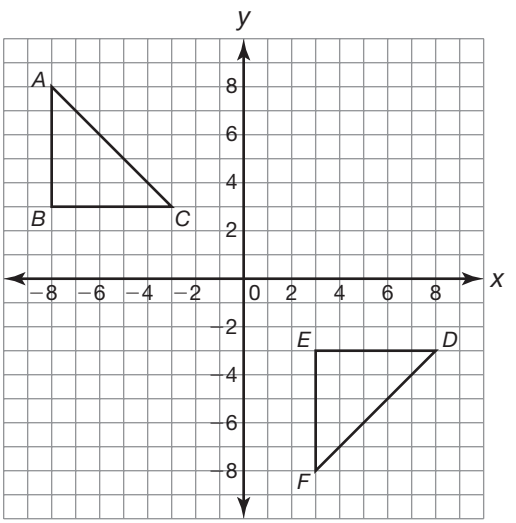
1.



Problem Set

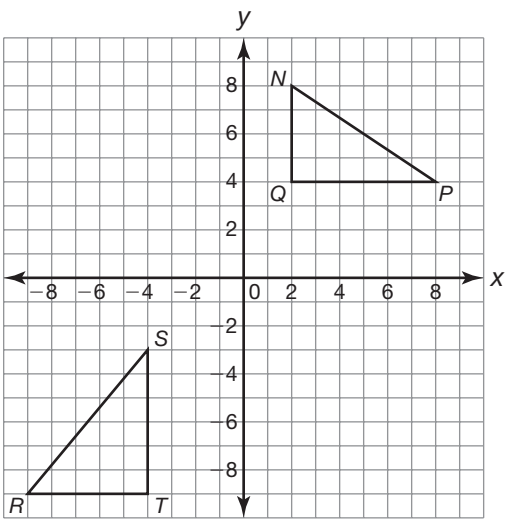
Determine whether each pair of given triangles are congruent by ASA.

1. Determine whether $\triangle ABC$ is congruent to $\triangle DEF$ by ASA.



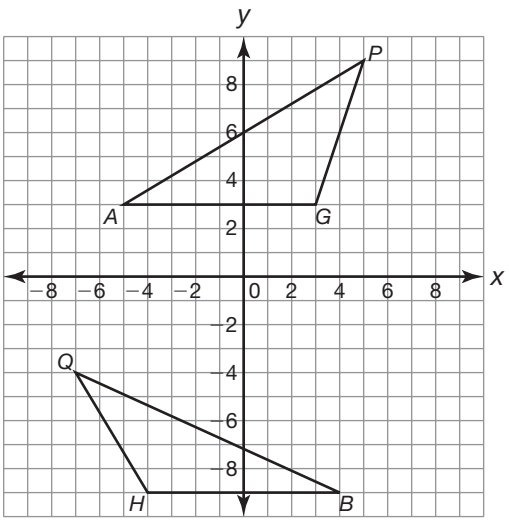
$m\angle B = m\angle E = 90°$
$m\angle C = m\angle F = 45°$
$BC = EF = 5$
The triangles are congruent by the ASA Congruence Theorem.

2. Determine whether $\triangle NPQ$ is congruent to $\triangle RST$ by ASA.

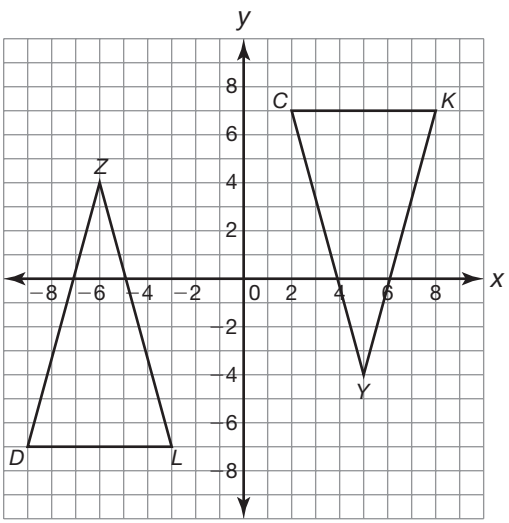


Name _____ Date _____

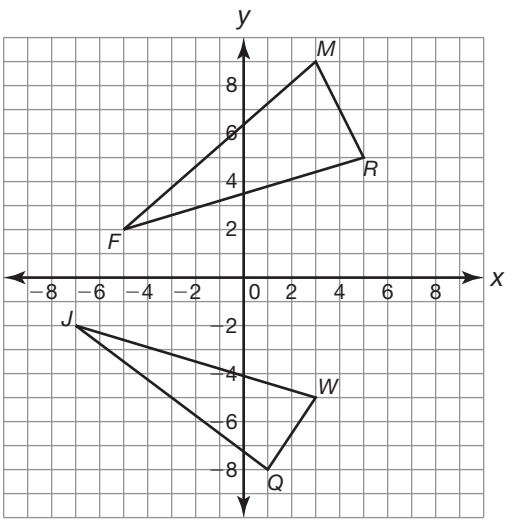
3. Determine whether $\triangle AGP$ is congruent to $\triangle BHQ$ by ASA.



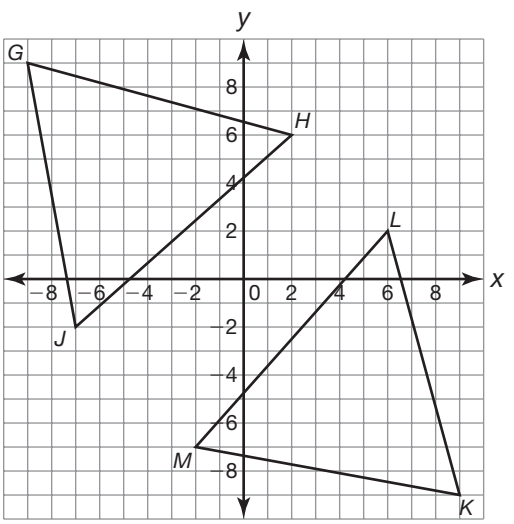
4. Determine whether $\triangle CKY$ is congruent to $\triangle DLZ$ by ASA.



5. Determine whether $\triangle FMR$ is congruent to $\triangle JQW$ by ASA.



6. Determine whether $\triangle GHJ$ is congruent to $\triangle KLM$ by ASA.



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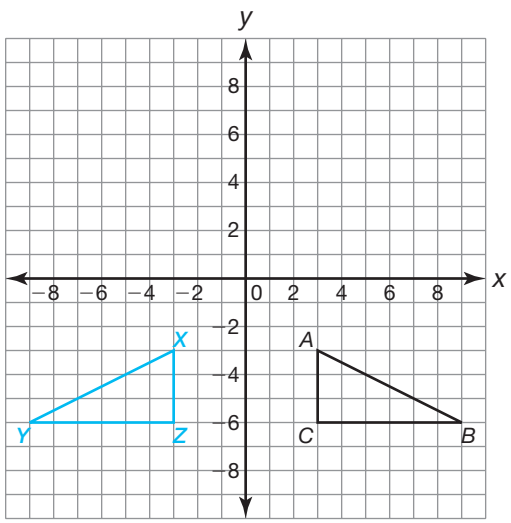
Name _____ Date _____

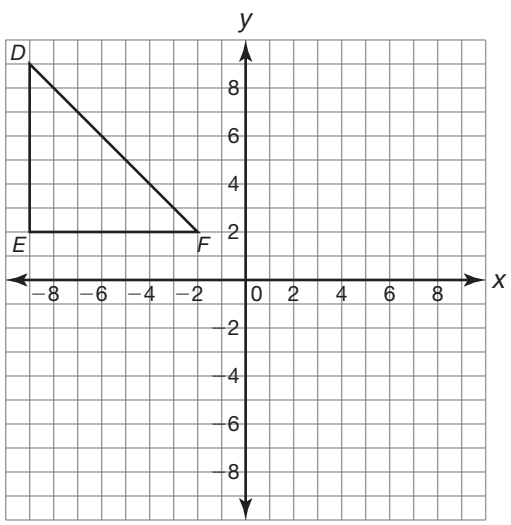
Perform the transformation described on each given triangle. Then verify that the triangles are congruent by ASA.

7. Reflect $\triangle ABC$ over the y-axis to form $\triangle XYZ$. Verify that $\triangle ABC \cong \triangle XYZ$ by SAS.

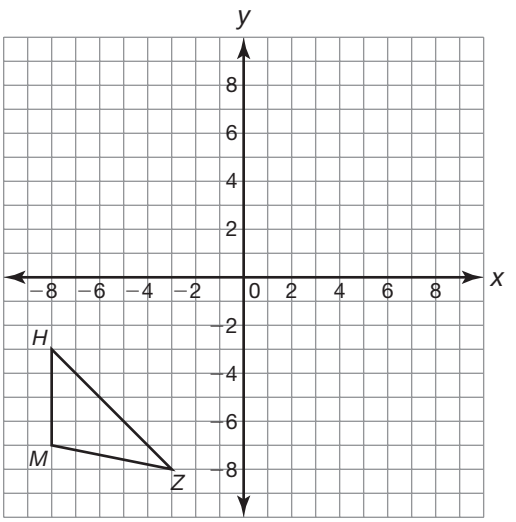


$m\angle C = m\angle Z = 90°$
$m\angle A = m\angle X = 63°$
$AC = XZ = 3$
The triangles are congruent by the ASA Congruence Theorem.

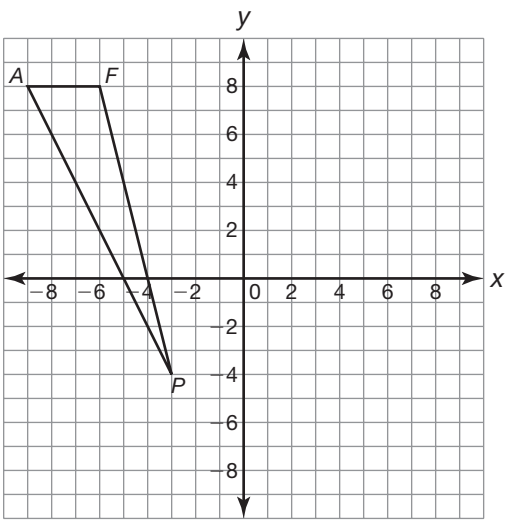
8. Rotate $\triangle DEF$ 90° counterclockwise to form $\triangle QRS$. Verify that $\triangle DEF \cong \triangle QRS$ by SAS.



9. Translate $\triangle HMZ$ 6 units to the right and 10 units up to form $\triangle BNY$. Verify that $\triangle HMZ \cong \triangle BNY$ by ASA.

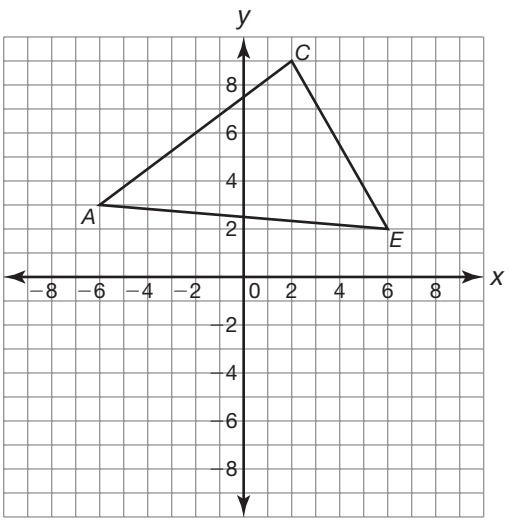


10. Reflect $\triangle AFP$ over the y-axis to form $\triangle DHW$. Verify that $\triangle AFP \cong \triangle DHW$ by ASA.

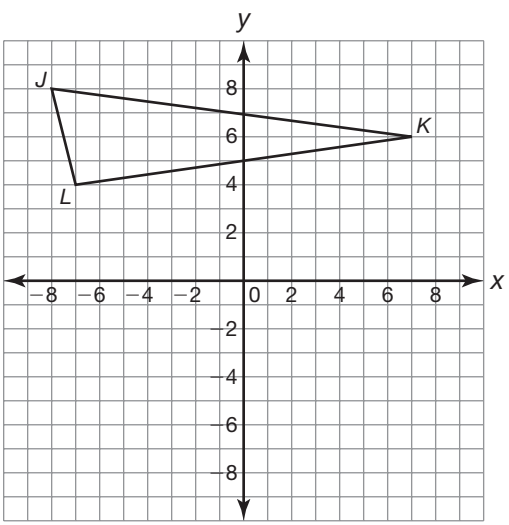


Name _____ Date _____

11. Rotate △*ACE* 180° counterclockwise to form △*JKQ*. Verify that △*ACE* ≅ △*JKQ* by SAS.



12. Reflect △*JKL* over the *x*-axis to form △*MNP*. Verify that △*JKL* ≅ △*MNP* by ASA.



Determine the angle measure or side measure that is needed in order to prove that each set of triangles are congruent by ASA.

13. In $\triangle ADZ$, $m\angle A = 20°$, $AD = 9$, and $m\angle D = 70°$. In $\triangle BEN$, $BE = 9$ and $m\angle E = 70°$.

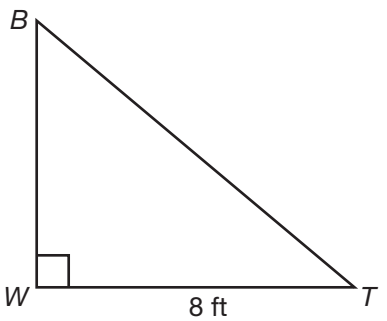
$m\angle B = 20°$

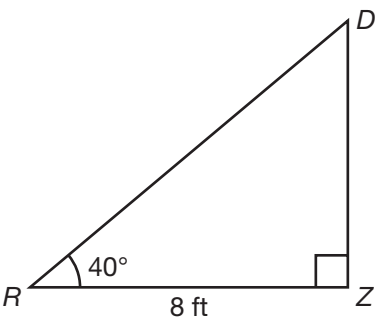
14. In $\triangle CUP$, $m\angle U = 45°$, and $m\angle P = 55°$, In $\triangle HAT$, $AT = 14$, $m\angle A = 45°$. and $m\angle T = 55°$.

15. In $\triangle HOW$, $m\angle H = 10°$, $HW = 3$, and $m\angle W = 60°$. In $\triangle FAR$, $FR = 3$ and $m\angle F = 10°$.

16. In $\triangle DRY$, $m\angle D = 100°$, $DR = 25$, and $m\angle R = 30°$, In $\triangle WET$, $m\angle W = 100°$ and $m\angle E = 30°$.

17.





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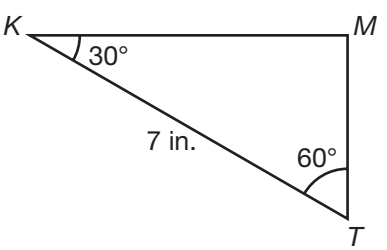
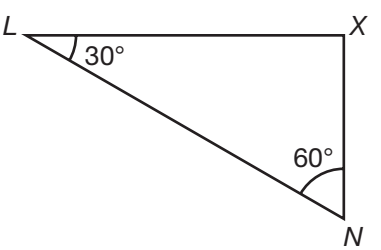
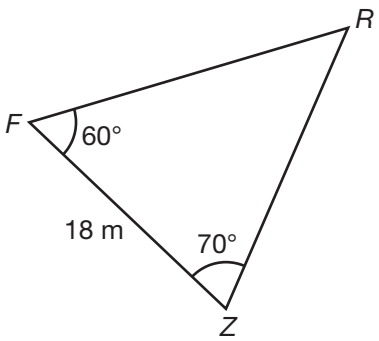
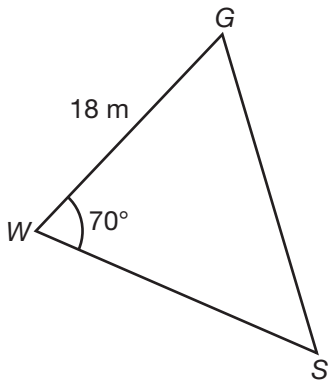




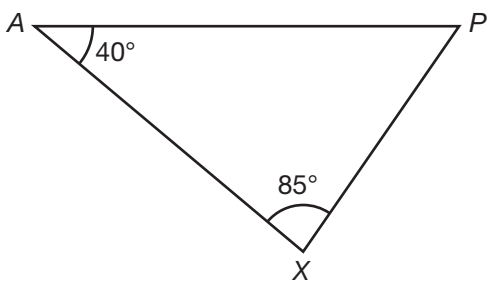
Name _____ Date _____

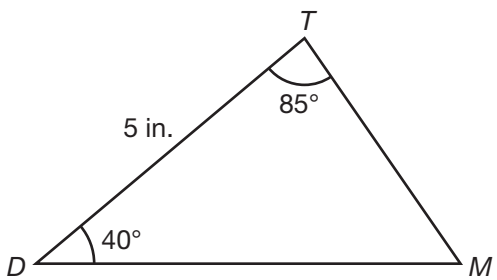
19.





20.





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Name _____ Date _____

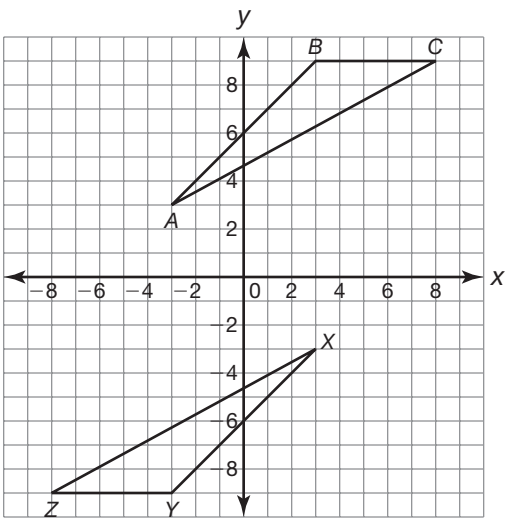
Ahhhhh . . . We're Sorry We Didn't Include You!

Angle-Angle-Side Congruence Theorem

Vocabulary

Describe how to prove the given triangles are congruent. Use the key terms *non-included side* and *Angle-Angle-Side Congruence Theorem* in your answer.

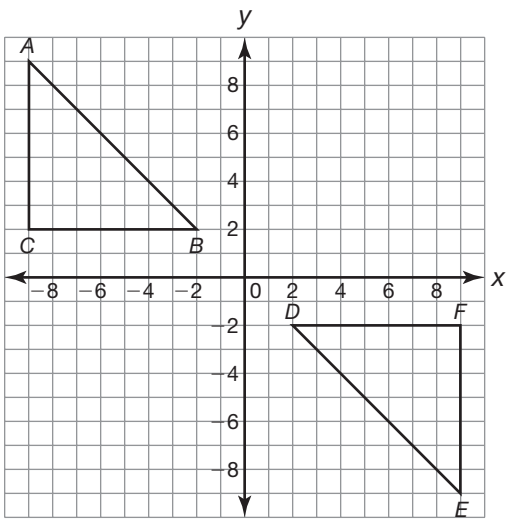
1.



Problem Set

Determine whether each set of given triangles are congruent by AAS.

1. Determine whether $\triangle ABC$ is congruent to $\triangle DEF$ by AAS.



Methods may vary.

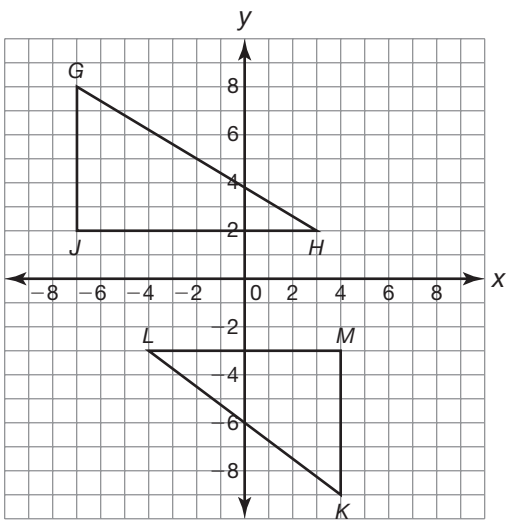
$m\angle A = m\angle D = 45°$

$m\angle B = m\angle E = 45°$

$BC = EF = 7$

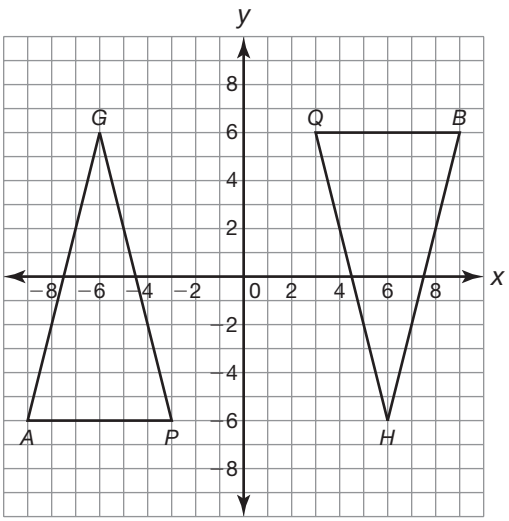
The triangles are congruent by the AAS Congruence Theorem.

2. Determine whether $\triangle GHJ$ is congruent to $\triangle KLM$ by AAS.

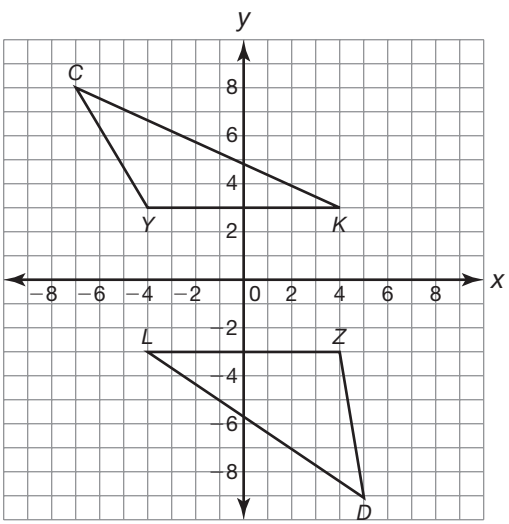


Name _____ Date _____

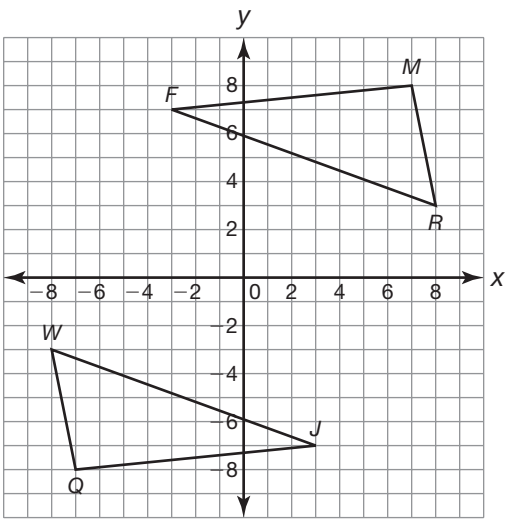
3. Determine whether $\triangle AGP$ is congruent to $\triangle BHQ$ by AAS.



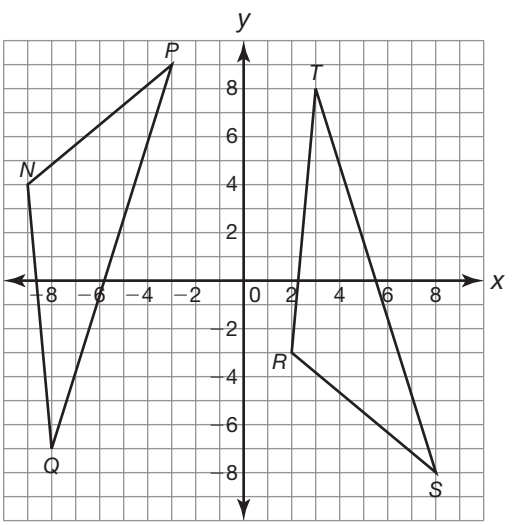
4. Determine whether $\triangle CKY$ is congruent to $\triangle DLZ$ by AAS.



5. Determine whether $\triangle FMR$ is congruent to $\triangle JQW$ by AAS.



6. Determine whether $\triangle NPQ$ is congruent to $\triangle RST$ by AAS.



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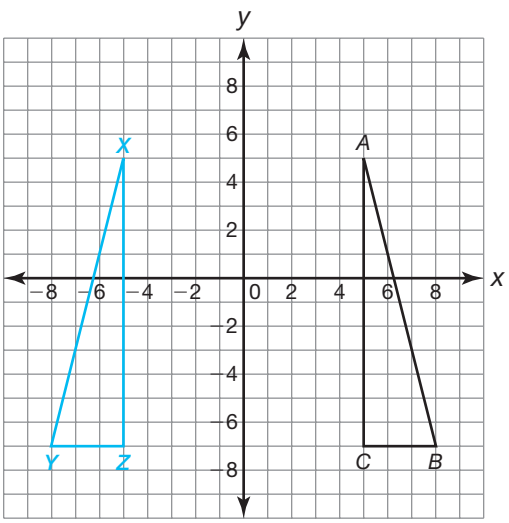
Perform the transformation described on each given triangle. Then verify that the triangles are congruent by AAS.

7. Reflect $\triangle ABC$ over the y-axis to form $\triangle XYZ$. Verify that $\triangle ABC \cong \triangle XYZ$ by AAS.



Methods may vary.

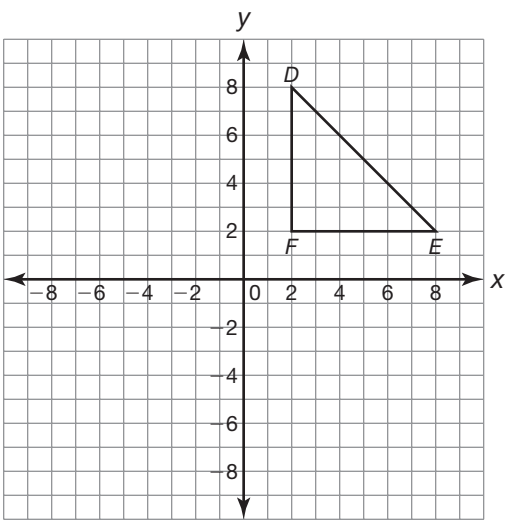
$m\angle B = m\angle Y = 76°$

$m\angle C = m\angle Z = 90°$

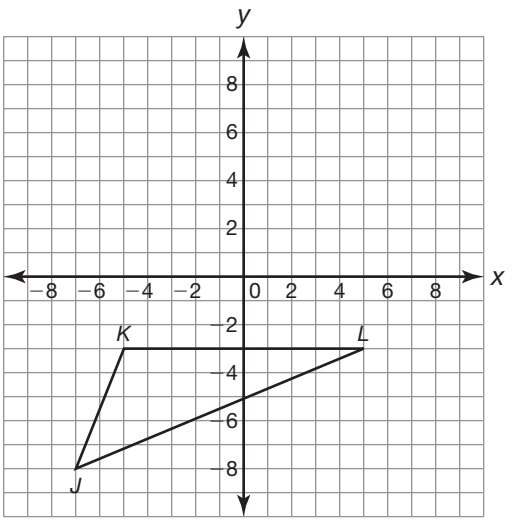
$AC = XZ = 12$

The triangles are congruent by the AAS Congruence Theorem.

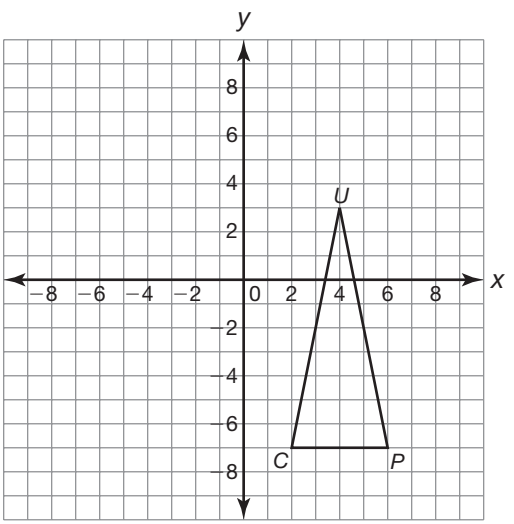
8. Translate $\triangle DEF$ 11 units to the left and 11 units down to form $\triangle QRS$. Verify that $\triangle DEF \cong \triangle QRS$ by AAS.



9. Rotate △*JKL* 180° counterclockwise to form △*MNP*. Verify that △*JKL* ≅ △*MNP* by AAS.



10. Translate △*CUP* 9 units to the left and 4 units up to form △*JAR*. Verify that △*CUP* ≅ △*JAR* by AAS.



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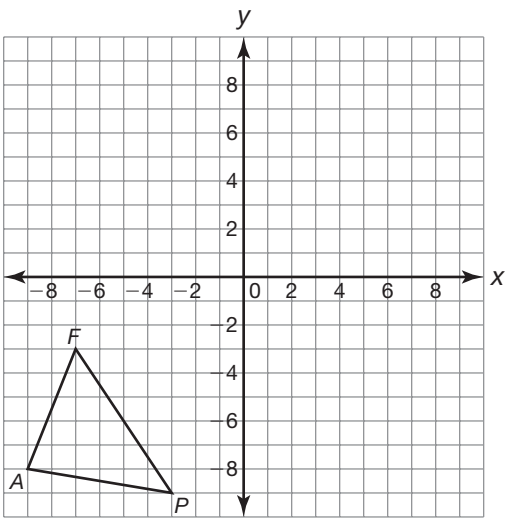
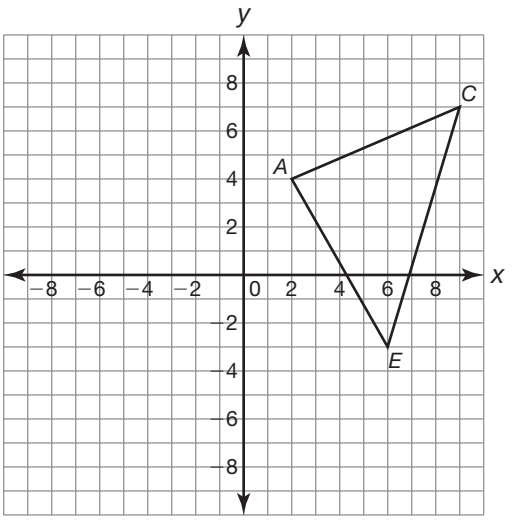
11. Reflect $\triangle AFP$ over the x-axis to form $\triangle DHW$. Verify that $\triangle AFP \cong \triangle DHW$ by AAS.



12. Rotate $\triangle ACE$ 270° counterclockwise to form $\triangle JKQ$. Verify that $\triangle ACE \cong \triangle JKQ$ by AAS.



Determine the angle measure or side measure that is needed in order to prove that each set of triangles are congruent by AAS.

13. In $\triangle ANT$, $m\angle A = 30°$, $m\angle N = 60°$, and $NT = 5$. In $\triangle BUG$, $m\angle U = 60°$ and $UG = 5$.

$m\angle B = 30°$

14. In $\triangle BCD$, $m\angle B = 25°$, and $m\angle D = 105°$. In $\triangle RST$, $RS = 12$, $m\angle R = 25°$, and $m\angle T = 105°$.

15. In $\triangle EMZ$, $m\angle E = 40°$, $EZ = 7$, and $m\angle M = 70°$. In $\triangle DGP$, $DP = 7$ and $m\angle D = 40°$.

16. In $\triangle BMX$, $m\angle M = 90°$, $BM = 16$, and $m\angle X = 15°$. In $\triangle CNY$, $m\angle N = 90°$ and $m\angle Y = 15°$.

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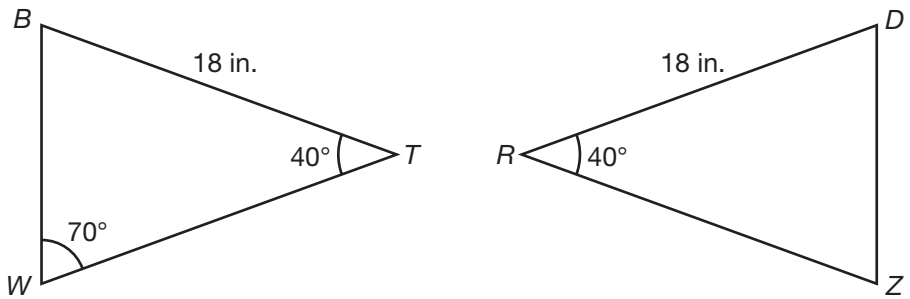
17.



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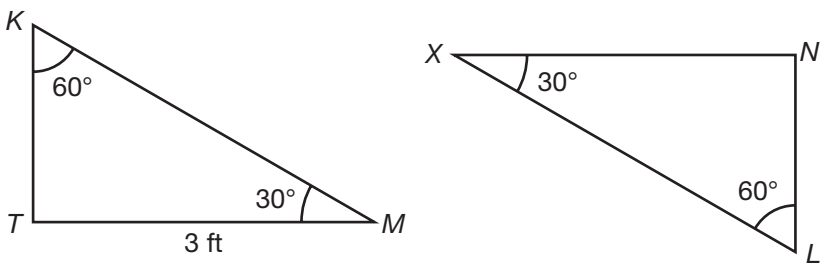

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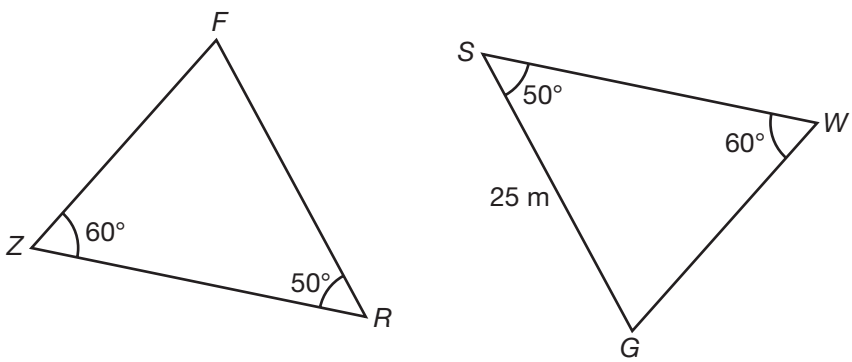

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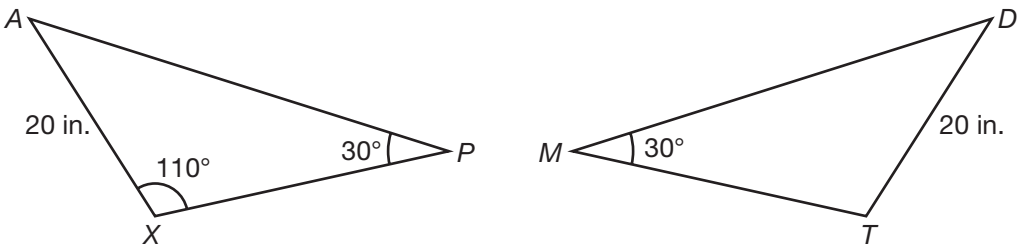
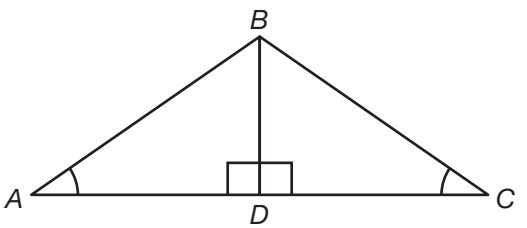


Determine whether there is enough information to prove that each pair of triangles are congruent by ASA or AAS. Write the congruence statements to justify your reasoning.

21. $\triangle ABD \stackrel{?}{\cong} \triangle CBD$



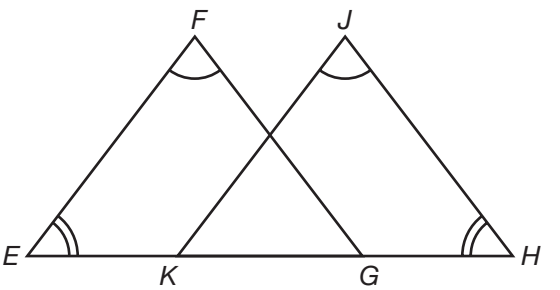
The triangles are congruent by AAS.

$\angle BAD \cong \angle BCD$

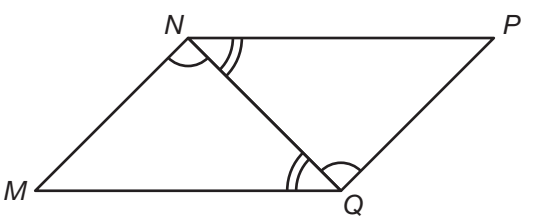
$\angle ADB \cong \angle CDB$

$\overline{BD} \cong \overline{BD}$

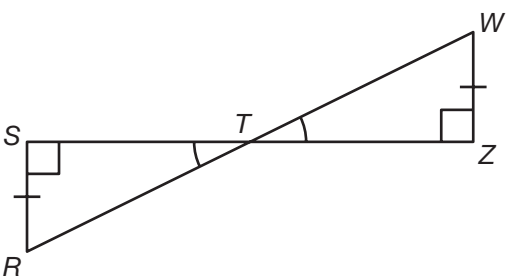
22. $\triangle EFG \stackrel{?}{\cong} \triangle HJK$



23. $\triangle MNQ \stackrel{?}{\cong} \triangle PQN$



24. $\triangle RST \stackrel{?}{\cong} \triangle WZT$



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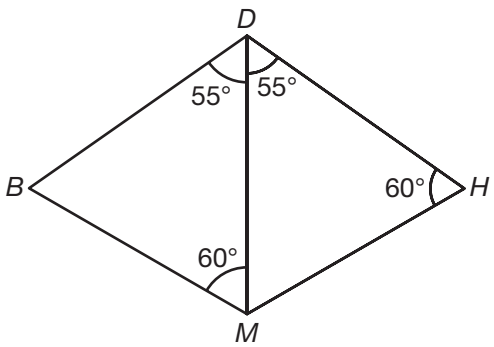
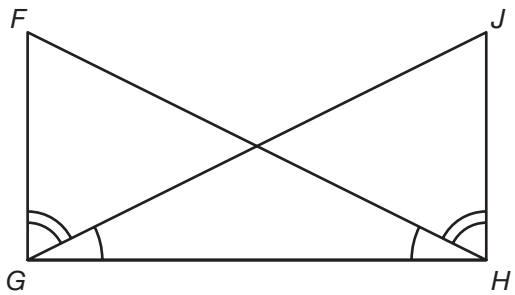
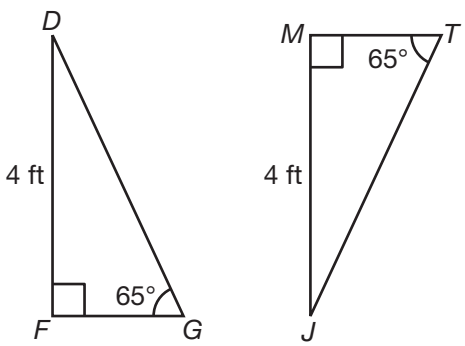
25. $\triangle BDM \stackrel{?}{\cong} \triangle MDH$



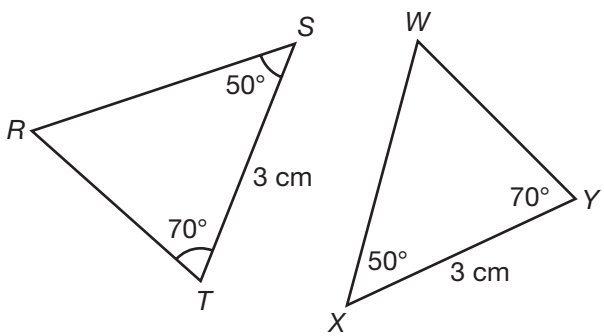
26. $\triangle FGH \stackrel{?}{\cong} \triangle JHG$



27. $\triangle DFG \stackrel{?}{\cong} \triangle JMT$



28. $\triangle RST \stackrel{?}{\cong} \triangle WXY$



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