Name ANSWER KEY Date HANYE Class GEOMETRY A

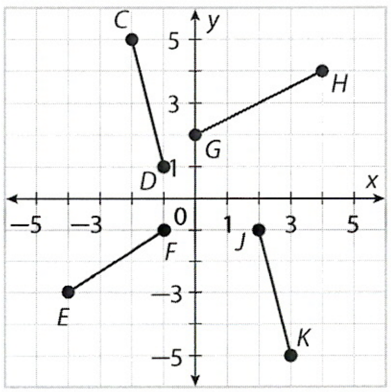
EXAM G.A

Geometry A: Final Exam Review

Modules 1 - 10

Section 1.1 – Segment Lengths & Midpoints

Use the distance formula to determine whether each pair of segments have the same length. $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$



1. $\overline{CD}$ and $\overline{EF}$

$CD = \sqrt{17}$

$EF = \sqrt{13}$

NOT THE SAME LENGTH

2. $\overline{GH}$ and $\overline{JK}$

$GH = \sqrt{20}$

$JK = \sqrt{17}$

NOT THE SAME LENGTH

Determine the coordinates of the midpoint for each segment. $M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

3. $\overline{PQ}$ has endpoints $P(5, -3)$ and $Q(2, 4)$.

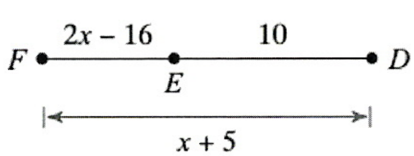
Midpoint: $\left(\frac{7}{2}, \frac{1}{2}\right)$

4. $\overline{RS}$ has endpoints $R(-2, 3)$ and $S(-8, -2)$.

Midpoint: $\left(-5, \frac{1}{2}\right)$

Use the Segment Addition Postulate to solve for x.

5.

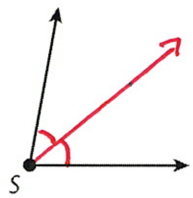


$\boxed{x = 11}$

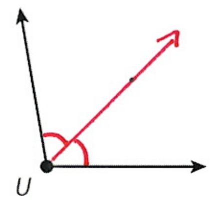
Section 1.2 – Angle Measures & Bisectors

Draw the bisector of each angle.

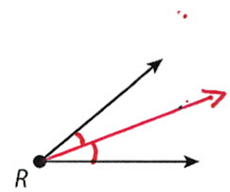
1.



2.

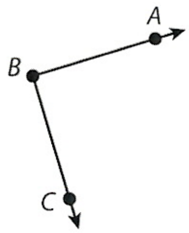


3.



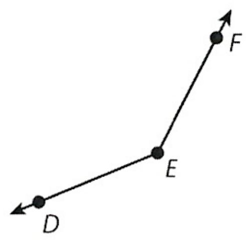
Determine the measure of each angle.

4.



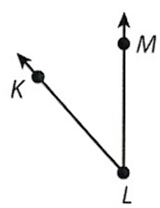
$m\angle ABC =$ $\boxed{90^\circ}$

5.



$m\angle DEF =$ $\boxed{140^\circ}$

6.

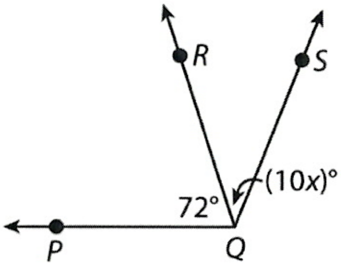


$m\angle KLM =$ $\boxed{42^\circ}$

Use the angle addition postulate to help find the measure of each angle

7. $m\angle PQS = 112°$

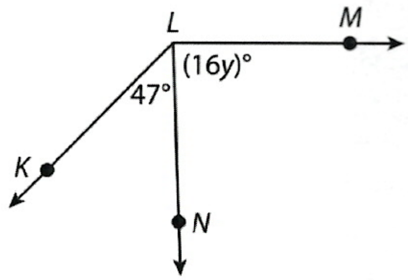
Find the value of x and $m\angle RQS$



$\boxed{x = 4}$

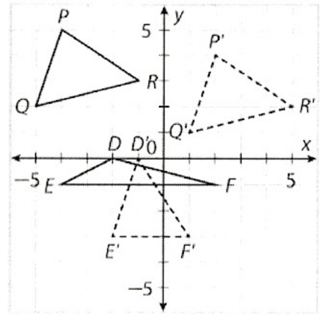
8. $m\angle KLM = 135°$.

Find the value of y and $m\angle MLN$



$\boxed{y = 5.5}$

Section 1.3 – Transformations



1. Write the coordinate points of ΔP'Q'R'

   P(−4, 5) → P'(2 , 4)

   Q(−5, 2) → Q'(1 , 1)

   R(−1, 3) → R'(5 , 2)

2. Write the coordinate notation of the transformation of Δ*PQR*.

   (*x*, *y*)→ (X+6 , y-1)

Name the transformation described by the given rule.

3. (*x*, *y*) → (−*x*, *y*)

   REFLECTION OVER Y-AXIS

4. (6, 2) → (−6, −2)

   180° ROTATION

5. (5, 8) → (8, −5)

   ROTATE 270° CCW (90° CW)

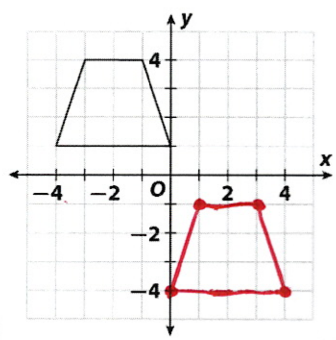
6. (*x*, *y*) → (*x* + 9, *y* + 2)

   RIGHT 9 , UP 2

Draw the image of each figure under the given transformation.

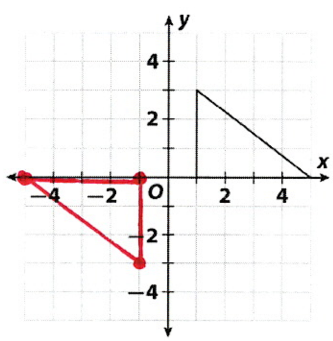
7. (*x*, *y*) → (*x* + 4, *y* − 5)

   RIGHT 4, DOWN 5



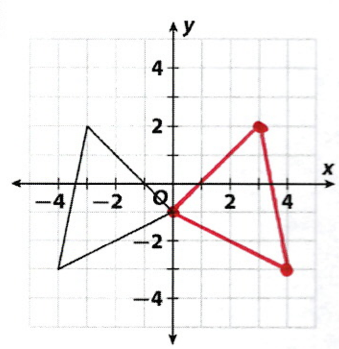
8. A 180° rotation around the origin

   (-x, -y)



9. A reflection across the *y*-axis

   (-x, y)



Section 1.4 – Reasoning & Proof

Fill in the blank with the correct conclusion about each situation.

1. Through any two points, there is EXACTLY ONE LINE

2. Through any three noncollinear points, there is EXACTLY ONE PLANE

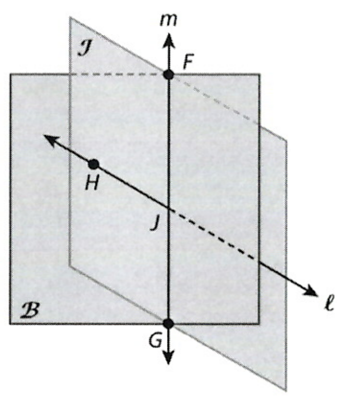
3. If two points lie in a plane, then the line containing those points LIES IN THE PLANE

4. If two lines intersect, then they intersect AT EXACTLY ONE POINT

5. If two planes intersect, then they intersect AT EXACTLY ONE LINE

Use the figure to name each of the results described.

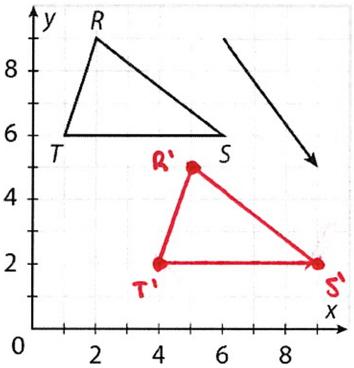
6.



Description	Example from the figure
the line of intersection of two planes	LINE GF
the point of intersection of two lines	J
three coplanar points	F, H, AND J
three collinear points	F, J, AND G

Section 2.1 – Translations

Use the figure below to answer Problems 1–3.



1. Triangle *RST* is translated along vector $\vec{v}$ to create the image *R'S'T'*. What are the coordinates of the vertices of the image?

R' (5, 5)

S' (9, 2)

T' (4, 2)

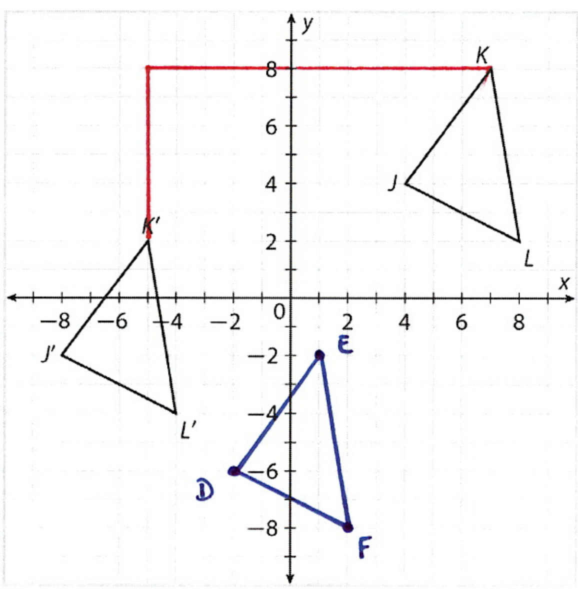
2. Write the coordinate notation for the translation of $\triangle RST$ to $\triangle R'S'T'$?

(x, y) → (X + 3 , y − 4)

3. Name vector $\vec{v}$ using component form. $\langle$ 3 , -4 $\rangle$

Use the figure below to answer Problems 4–5.

4. Triangle *J'K'L'* is the image of $\triangle JKL$ under a translation. Draw the translation vector $\vec{v}$ from *J* to its image in $\triangle J'K'L'$. Write the vector in component form. $\langle$ -12 , -6 $\rangle$



5. Triangle *J'K'L'* is also the image of $\triangle DEF$ under a translation along a vector $\langle -6, 4 \rangle$. Find the coordinates of points *D, E,* and *F,* and draw $\triangle DEF$.

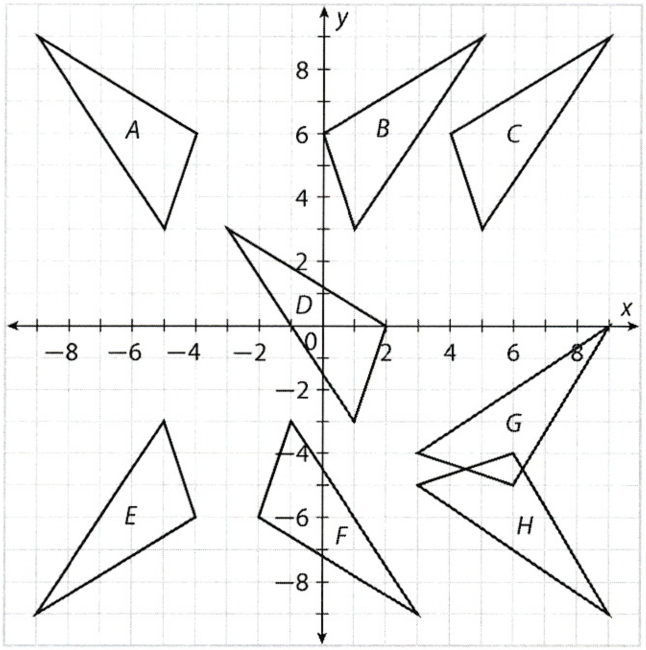
D (-2, -6)

E (1, -2)

F (2, -8)

Section 2.2 – Reflections

Study the figures on the grid and answer the questions.

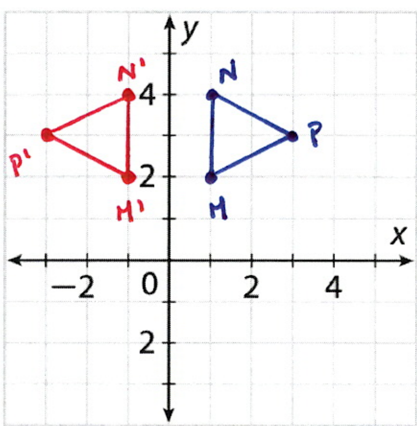


1. Which figure is the reflection of figure *A* over the *y*-axis? C
2. Which two figures have $x = -3$ as their line of reflection? E and F
3. Which figure is the reflection of figure *A* over the line $y = x$? H
4. What is the equation of the line of reflection for figures *G* and *H*?

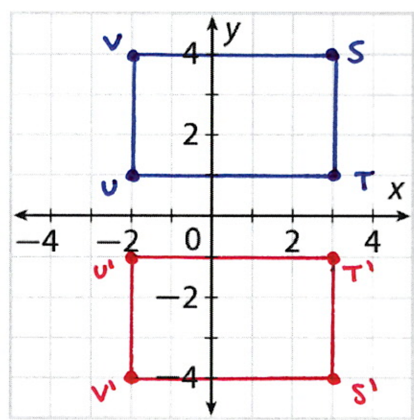
   y = -4.5
5. Which figures are **not** reflections of figure *A*? Name all. D, F, G

Reflect the figure over the given line of reflection

6. $M(1, 2), N(1, 4), P(3, 3)$; y-axis

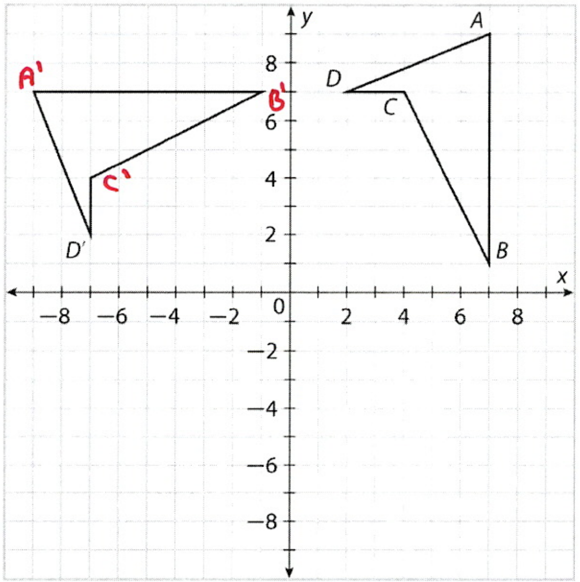


7. $S(3, 4), T(3, 1), U(-2, 1), V(-2, 4)$; x-axis



Section 2.3 – Rotations

Follow the directions for Problems 1–2 to analyze rotations.



1. How many degrees was figure

   ABCD rotated to A'B'C'D'?

   __90°__ degrees counterclockwise

2. Write the coordinate notation rule

   (x, y) → (__-y__ , __x__)

3. Find the coordinates of points on *ABCD* and corresponding points on its image. Label *A'*, *B'*, and *C'*.

   A(__7__, __9__) *A'*(__-9__, __7__)

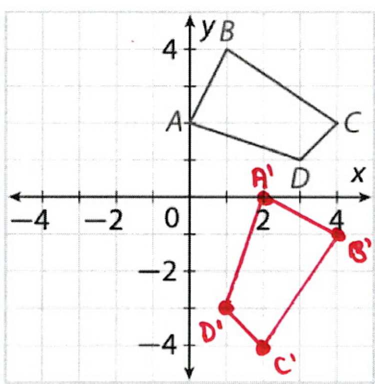
   B(__7__, __1__) *B'*(__-1__, __7__)

   C(__4__, __7__) *C'*(__-7__, __4__)

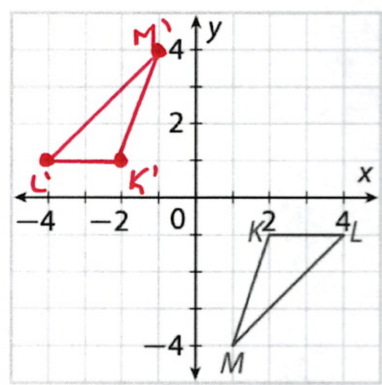
   D(__2__, __7__) *D'*(__-7__, __2__)

Draw the image of the figure under the given rotation (counterclockwise).

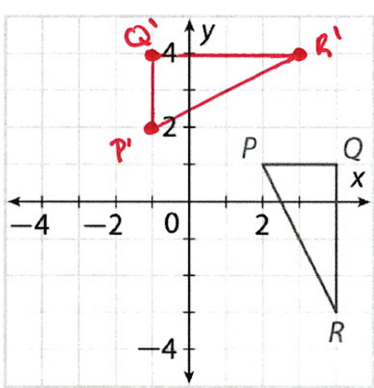
4. Quadrilateral *ABCD*; 270°



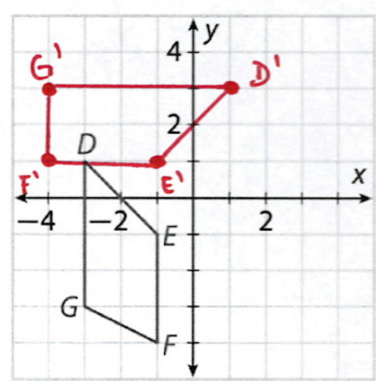
5. $\triangle KLM$; 180°



6. $\triangle PQR$; 90°

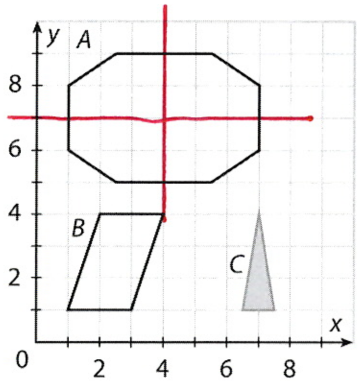


7. Quadrilateral *DEFG*; 270°



Section 2.4 – Symmetry (Lines & Rotational)

Use the figures on the grid to answer Problems 1–3.



1. What are the equations of the lines of symmetry for figure *A*?

   x = 4 and y = 7

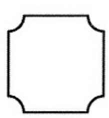
2. Does figure *B* have line symmetry, rotational symmetry, or both?

   ROTATIONAL

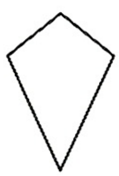
3. Does figure *C* have line symmetry, rotational symmetry, or both?

   BOTH (LINE + ROTATIONAL)

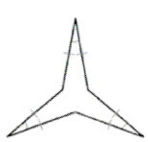
Tell whether each figure appears to have line symmetry, rotational symmetry, both, or neither. If line symmetry, tell how many lines of symmetry. If rotational symmetry, give the angle of rotational symmetry.

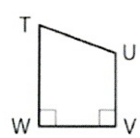
4. 
   4 LINES
   90°, 180°, 270°

5. 
   NO LINES
   180°

6. 
   1 LINE
   NO ROTATIONAL

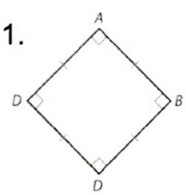
7. 
   5 LINES
   72°, 144°, 216°, 288°

8. 
   3 LINES
   120°, 240°

9. 

   NO LINES
   NO ROTATIONAL

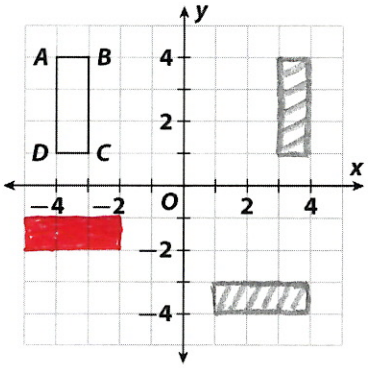
10. 
    4 LINES
    90°, 180°, 270°

11. 

    4 LINES
    90°, 180°, 270°

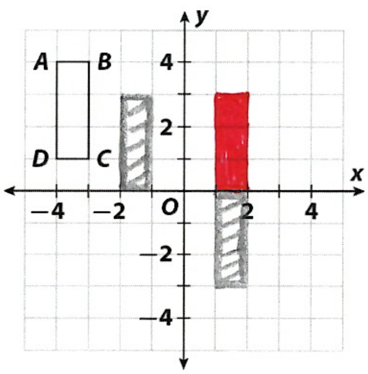
Section 3.1 – Sequence of Transformations

1. **Rectangle *ABCD* is reflected across the *y*-axis, rotated 90° clockwise, and translated along the vector ⟨–6, 2⟩. Plot each transformation.**



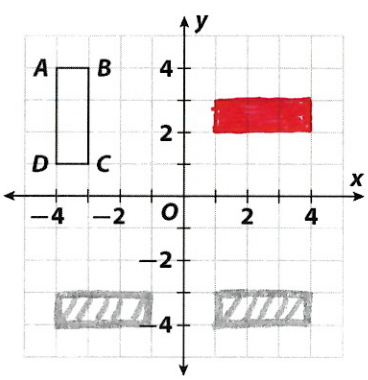
	$-x, y$	$y, -x$	$-6, +2$
A(−4, 4) →	A′(4, 4) →	A″(4, −4) →	A‴(−2, −2)
B(−3, 4) →	B′(3, 4) →	B″(4, −3) →	B‴(−2, −1)
C(−3, 1) →	C′(3, 1) →	C″(1, −3) →	C‴(−5, −1)
D(−4, 1) →	D′(4, 1) →	D″(1, −4) →	D‴(−5, −2)

2. **Rectangle *ABCD* is translated along the vector $\langle 2, -1 \rangle$, rotated 180°, and reflected across the x-axis. Plot each transformation.**



	$+2 \quad -1$	$-x, -y$	$x, -y$
A(−4, 4) →	A′(−2, 3) →	A″(2, −3) →	A‴(2, 3)
B(−3, 4) →	B′(−1, 3) →	B″(1, −3) →	B‴(1, 3)
C(−3, 1) →	C′(−1, 0) →	C″(1, 0) →	C‴(1, 0)
D(−4, 1) →	D′(−2, 0) →	D″(2, 0) →	D‴(2, 0)

3. **Rectangle *ABCD* is rotated 90° counterclockwise, reflected across the y-axis, and translated along the vector $\langle 0, 6 \rangle$. Plot 0each transformation.**

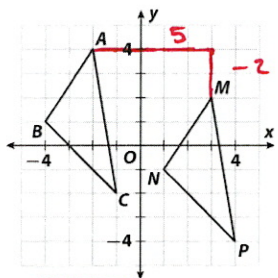


	$-y, x$	$-x, y$	$0 \quad +6$
A(−4, 4) →	A′(−4, −4) →	A″(4, −4) →	A‴(4, 2)
B(−3, 4) →	B′(−4, −3) →	B″(4, −3) →	B‴(4, 3)
C(−3, 1) →	C′(−1, −3) →	C″(1, −3) →	C‴(1, 3)
D(−4, 1) →	D′(−1, −4) →	D″(1, −4) →	D‴(1, 2)

Section 3.2 – Proving Figures Congruent

Determine whether $\triangle ABC$ and $\triangle MNP$ are congruent.
If they are, specify a sequence of rigid motions that maps one figure onto the other.

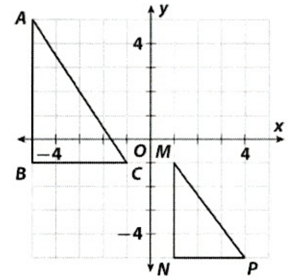
1.



YES

RIGHT 5, DOWN 2

2.

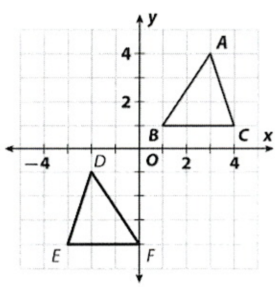


NO

DIFFERENT SIZES

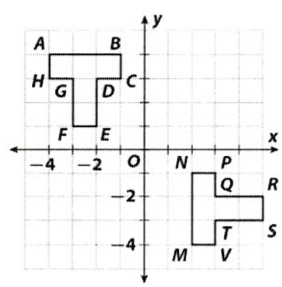
For each pair of congruent figures, specify a sequence of rigid motions that maps one figure onto the other.

3.



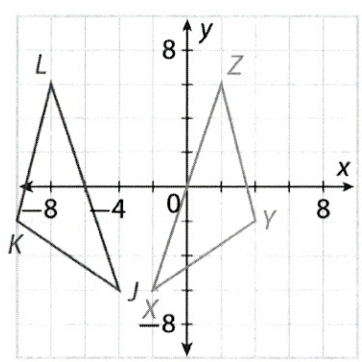
- REFLECTED OVER Y-AXIS
- RIGHT 1, DOWN 5

4.



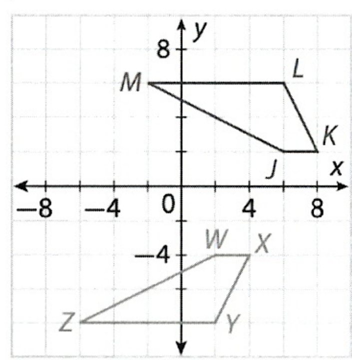
- ROTATE 270° CW OR 90° CCW
- RIGHT 6

5.



- REFLECT OVER Y-AXIS
- LEFT 3

6. $JKLM \cong WXYZ$



- REFLECT OVER X-AXIS
- RIGHT 2, DOWN 1

Section 3.3 – Corresponding Parts of Congruent Figures

List all of the pairs of congruent angles and sides of the figures.

1. $\triangle KLM \cong \triangle GHI$

$\angle K \cong$ $\angle G$ KL $\cong$ GH

$\angle L \cong$ $\angle H$ LM $\cong$ HI

$\angle M \cong$ $\angle I$ KM $\cong$ GI

2. Rhombus *WXYZ* $\cong$ rhombus *DEFG*

$\angle W \cong$ $\angle D$ WX $\cong$ DE

$\angle X$ $\cong \angle E$ XY $\cong$ EF

$\angle Y$ $\cong \angle F$ YZ $\cong$ FG

$\angle Z \cong$ $\angle G$ WZ $\cong$ DG

Quadrilateral *ABCD* $\cong$ quadrilateral *EFGH*. Find the value of the indicated variable. Use the diagrams provided below.

3. Find the value of *w*.

$w = 0.2$

4. Find the value of *x*.

$x = 25$

5. Find the value of *y*.

$y = 5$

6. Find the value of *z*.

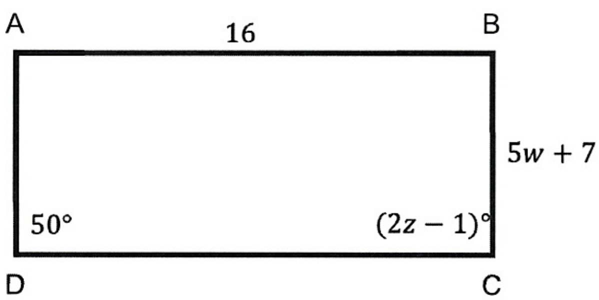
$z = 40.5$

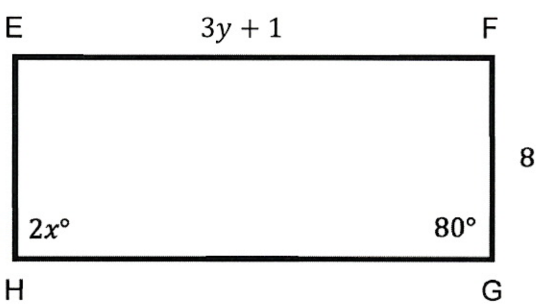
7. What is the length of EF.

16

8. What is the measure of $\angle C$.

80°





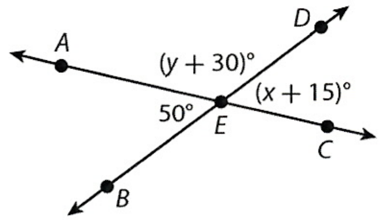
Name ______________________ Date ______________ Class ______________

Section 4.1 – Angles Formed by Intersecting Lines

1. The sum of the angle measures for a linear pair is: 180

2. Vertical angles are: CONGRUENT

Use the figures for Problems 3–8.



3. supplement of $\angle AEB$ = 130

4. complement of $\angle AEB$ = 40

5. x = 35

6. y = 100

7. $m\angle DEC$ = 50

8. $m\angle AED$ = 130

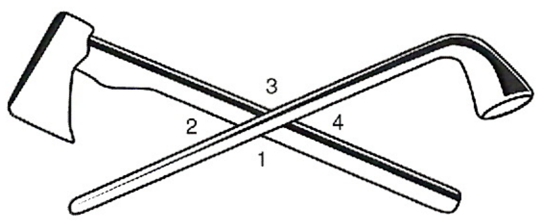
9. $\angle DEF$ and $\angle FEG$ are complementary. $m\angle DEF = (3x - 4)°$, and $m\angle FEG = (5x + 6)°$.

x = 11 $\angle$DEF = 29 $\angle$FEG = 61

10. $\angle DEF$ and $\angle FEG$ are supplementary. $m\angle DEF = (9x + 1)°$, and $m\angle FEG = (8x + 9)°$.

x = 10 $\angle$DEF = 91 $\angle$FEG = 89

Use the figure for Problems 11 and 12.



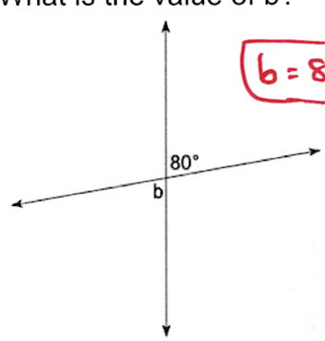
11. Name a pair of vertical angles.

$\angle 1 + \angle 3$, $\angle 2 + \angle 4$

12. Name a linear pair of angles.

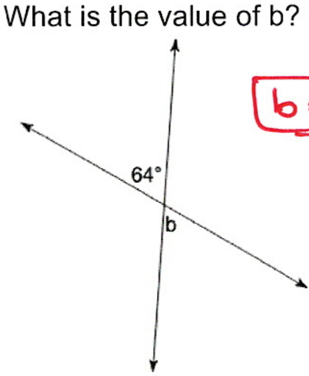
$\angle 1 + \angle 2$, $\angle 2 + \angle 3$, $\angle 3 + \angle 4$, $\angle 1 + \angle 4$

13. What is the value of b?



$\boxed{b = 80}$

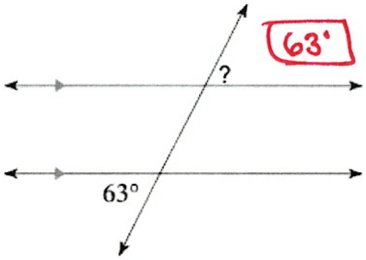
14. What is the value of b?



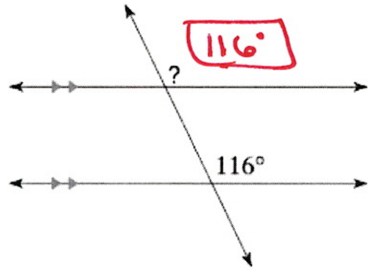
$\boxed{b = 64}$

Section 4.2 – Transversals & Parallel Lines

Find each angle measure and state the angle relationship (Alternate Interior, Alternate Exterior, Corresponding, Same Side Interior).



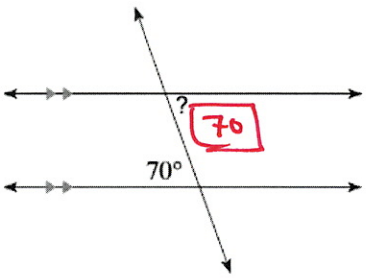
63°



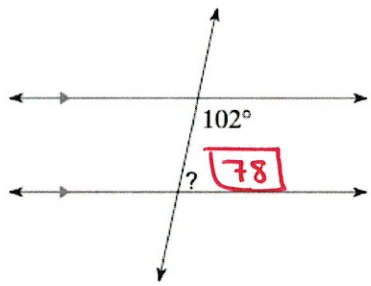
116°

1. ALT. EXT.

2. CORRESPONDING



70

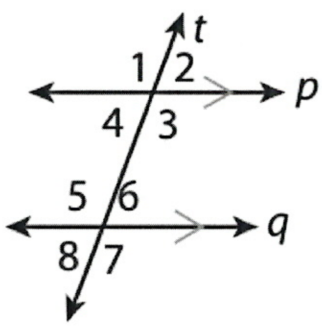


78

3. ALT. INT

4. SAME SIDE INT.

For questions 5 & 6, use the diagram below.



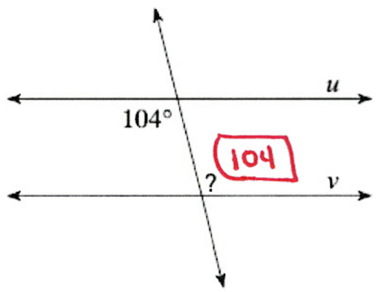
5. List all the angles congruent to ∠5: ∠1, ∠3, ∠7

6. List all the angles congruent to ∠4: ∠2, ∠6, ∠8

Section 4.3 – Proving Lines Parallel

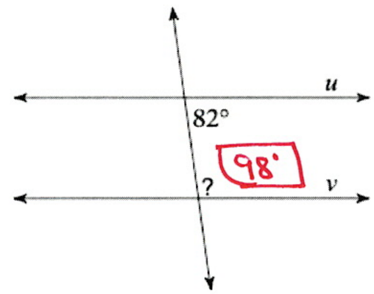
Find the angle measure that makes the lines parallel. State the converse that proves lines parallel.

1.



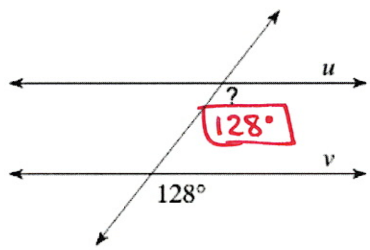
CONV. OF ALT. INT.

2.



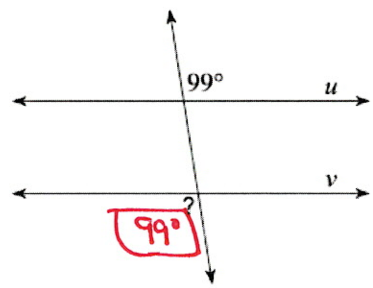
CONV. OF SAME SIDE INT.

3.



CONV. OF CORRESPONDING

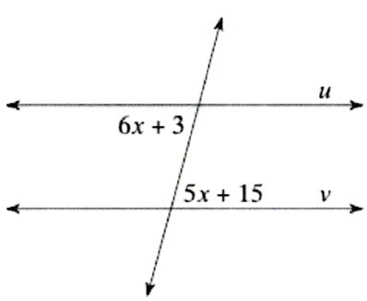
4.



CONV. OF ALT. EXT.

Find the value of x that makes the lines parallel. State the converse that proves the lines parallel.

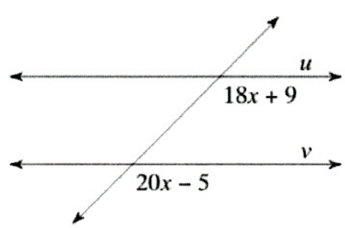
5.



CONV. OF ALT. INT.

$\boxed{x = 12}$

6.



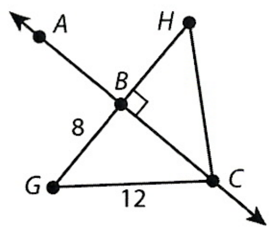
CONV. OF CORRESPONDING

$\boxed{x = 7}$

Section 4.4 – Perpendicular Lines

For Problems 1–5, determine the unknown values.

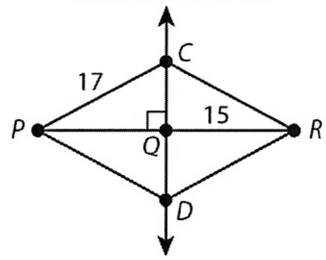
1. Given: $\overrightarrow{AC}$ is the perpendicular bisector of $\overline{GH}$.



$GH =$ 16

$CH =$ 12

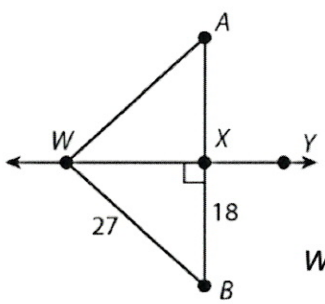
2. Given: $\overleftrightarrow{CD}$ is the perpendicular bisector of $\overline{PR}$.



$CR =$ 17

$PQ =$ 15

3. Given: $\overleftrightarrow{WY}$ is the perpendicular bisector of $\overline{AB}$.

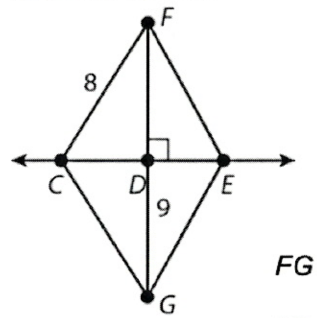


$WA =$ 27

$AX =$ 18

$AB =$ 36

4. Given: $\overleftrightarrow{CE}$ is the perpendicular bisector of $\overline{FG}$.



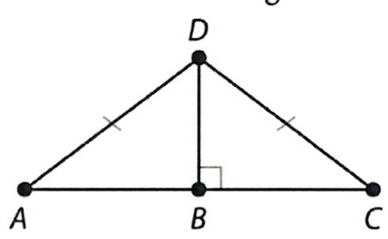
$FG =$ 18

$FD =$ 9

$CG =$ 8

Use the Converse of the Perpendicular Bisector Theorem and the Pythagorean Theorem.

5. $\overline{AD}$ is 10 inches long. $\overline{BD}$ is 6 inches long. Find the length of $\overline{AC}$.



$\boxed{AC = 16}$

Section 4.5 – Equations of Parallel & Perpendicular Lines

POINT–SLOPE FORM: $y - y_1 = m(x - x_1)$

\Write an equation parallel to the given line through the given point.

1. parallel to $y = 9x + 4$ through (2, 7)

$\boxed{y = 9x - 11}$

2. parallel to $y = 4x - 6$ through (6, –3)

$\boxed{y = 4x - 27}$

3. parallel to $y = \frac{2}{3}x + 6$ through (–3, 6)

$\boxed{y = \frac{2}{3}x + 8}$

4. parallel to $y = -\frac{1}{4}x - 12$ through (12, 10)

$\boxed{y = -\frac{1}{4}x + 13}$

Write an equation perpendicular to the given line through the given point.

5. perpendicular to $y = \frac{1}{4}x + 3$ through (4, 1)

$\boxed{y = -4x + 17}$

6. perpendicular to $y = -\frac{1}{3}x - 6$ through (–2, 8)

$\boxed{y = 3x + 14}$

7. perpendicular to $y = -6x - 9$ through (6, 10)

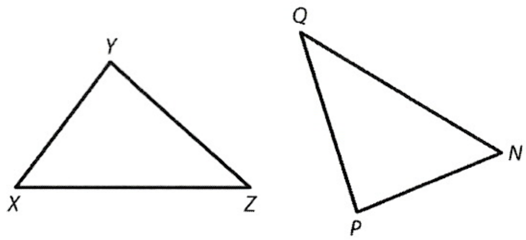
$\boxed{y = \frac{1}{6}x + 9}$

8. perpendicular to $y = 5x + 14$ through (5, –3)

$\boxed{y = -\frac{1}{5}x - 2}$

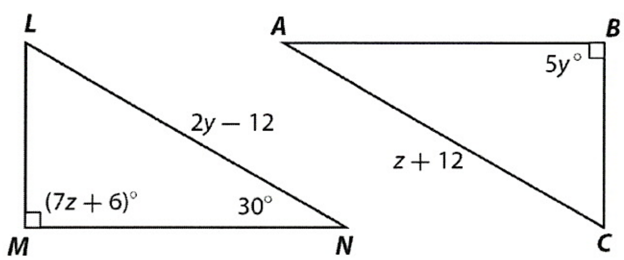
Section 5.1 – Exploring Triangle Congruency

$\triangle XYZ \cong \triangle NPQ$. Identify the congruent corresponding parts.



1. $\angle Z \cong$ $\angle Q$
2. $\overline{YZ} \cong$ $\overline{PQ}$
3. $\angle P \cong$ $\angle Y$
4. $\angle X \cong$ $\angle N$
5. $\overline{NQ} \cong$ $\overline{XZ}$
6. $\overline{PN} \cong$ $\overline{YX}$

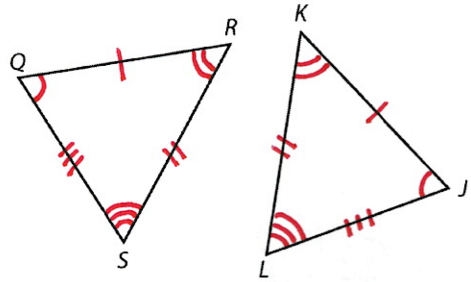
$\triangle LMN \cong \triangle CBA$. Find each value.



7. $z =$ 12
8. $y =$ 18
9. $m\angle L =$ 60°
10. $LN =$ 24
11. $m\angle C =$ 60°
12. $AC =$ 24

$\triangle QRS \cong \triangle JKL$.

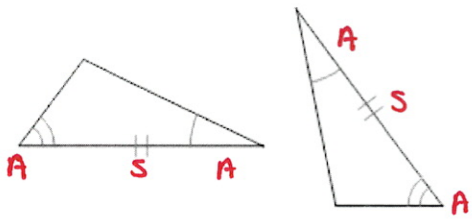
13. Mark all the congruent corresponding parts of the two triangles.



Section 5.2 – ASA Triangle Congruence

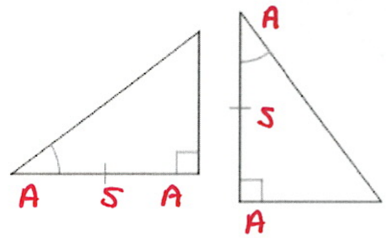
Are the two triangles congruent? If so, what statement proves them congruent. (ASA)

1.



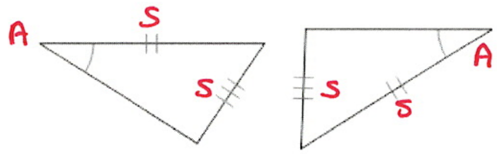
yes by ASA

2.



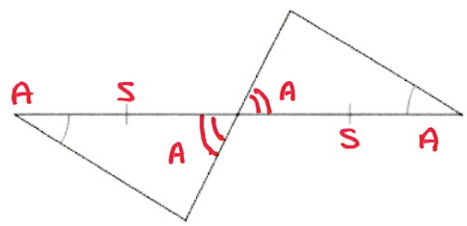
yes by ASA

3.



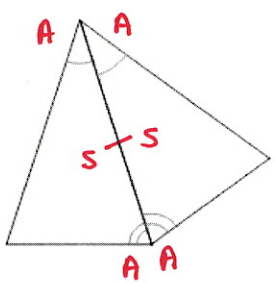
No → SSA

4.



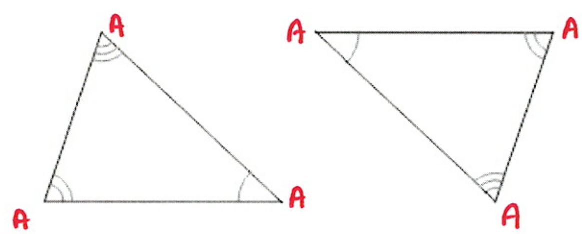
yes by ASA

5.



yes by ASA

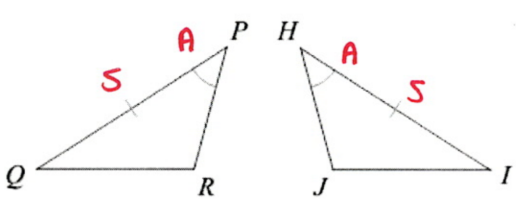
6.



No → AAA

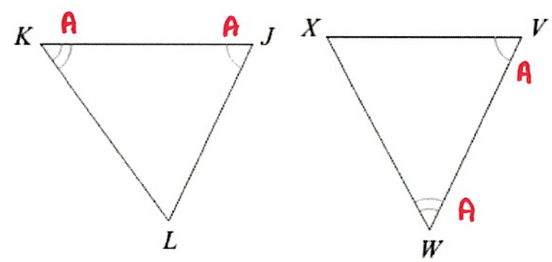
What additional information is needed to prove the two triangles congruent by ASA.

7.



$\angle Q \cong \angle I$

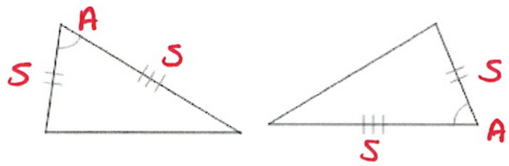
8.



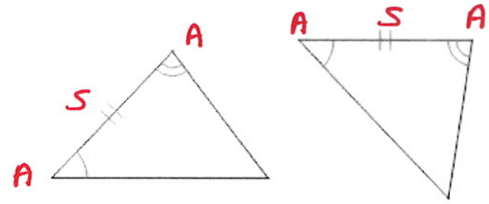
$KJ \cong WV$

Section 5.3 – SAS Triangle Congruence

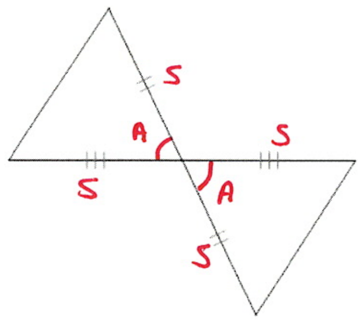
Are the two triangles congruent? If so, what statement proves them congruent. (ASA or SAS)

1. 

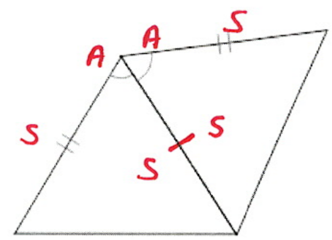
YES BY SAS

2. 

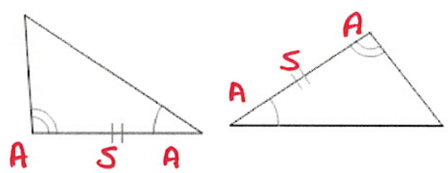
YES BY ASA

3. 

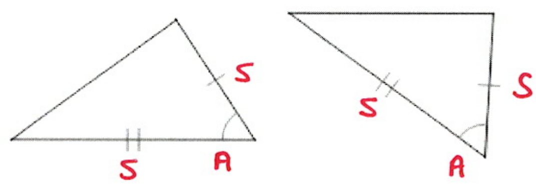
YES BY SAS

4. 

YES BY SAS

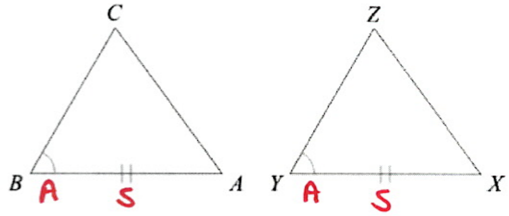
5. 

YES BY ASA

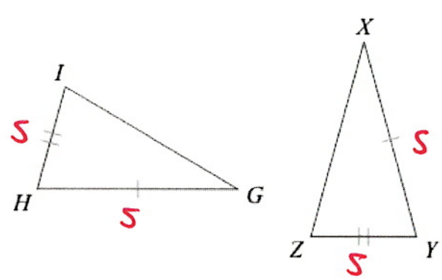
6. 

YES BY SAS

What additional information is needed to prove the two triangles congruent by SAS.

7. 

$BC \cong YZ$

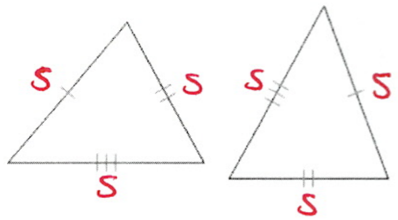
8. 

$\angle H \cong \angle Y$

Section 5.4 – SSS Triangle Congruence

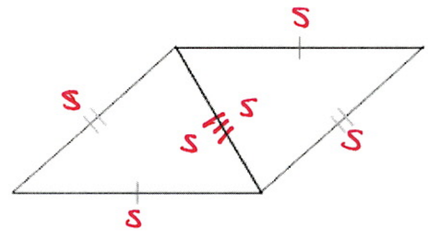
Are the two triangles congruent? If so, what statement proves them congruent. (ASA or SAS or SSS)

1.



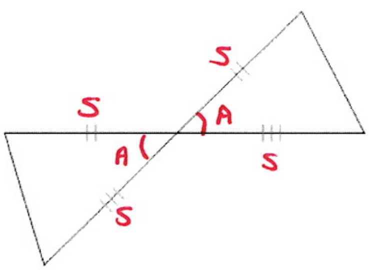
yes By SSS

2.



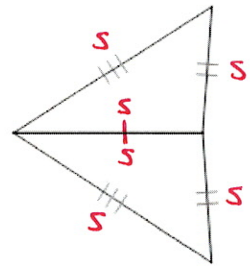
yes By SSS

3.



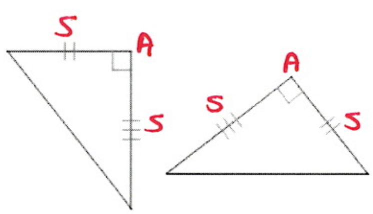
yes By SAS

4.



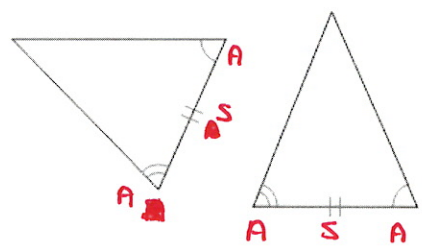
yes By SSS

5.



yes By SAS

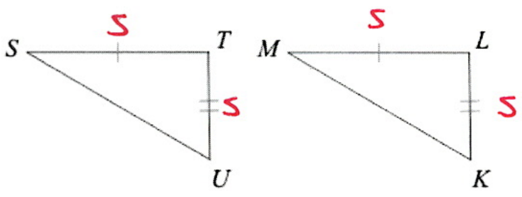
6.



yes By ASA

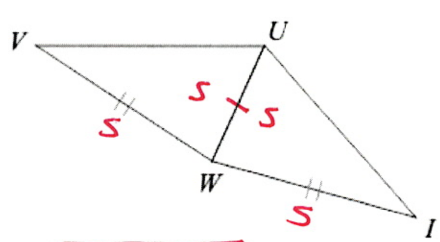
What additional information is needed to prove the two triangles congruent by SSS.

7.



$SU \cong MK$

8.

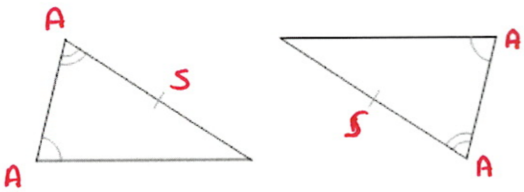


$VU \cong IU$

Section 6.2 – AAS Triangle Congruence

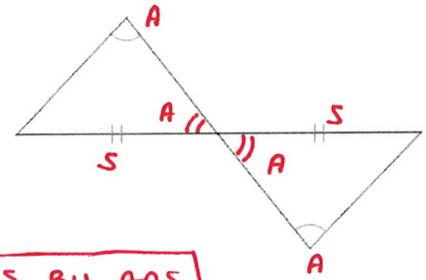
Are the two triangles congruent? If so, what statement proves them congruent. (ASA or SAS or SSS or AAS)

1.



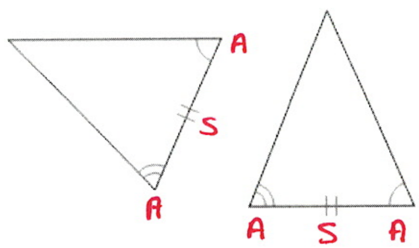
YES BY AAS

2.



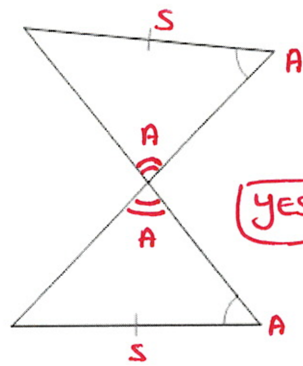
YES BY AAS

3.



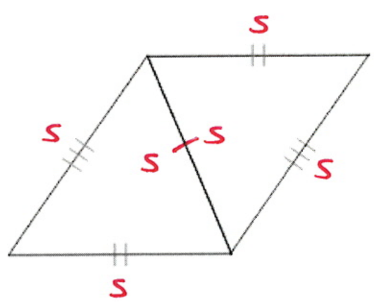
YES BY ASA

4.



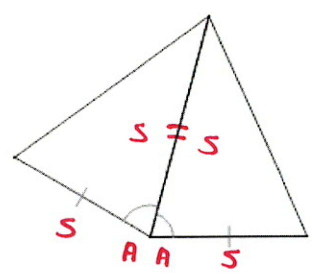
YES BY AAS

5.



YES BY SSS

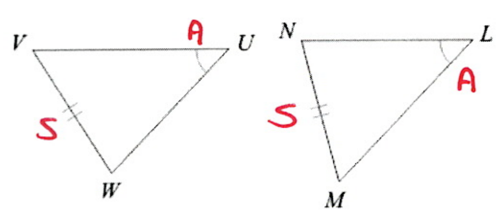
6.



YES BY SAS

What additional information is needed to prove the two triangles congruent by AAS.

7.

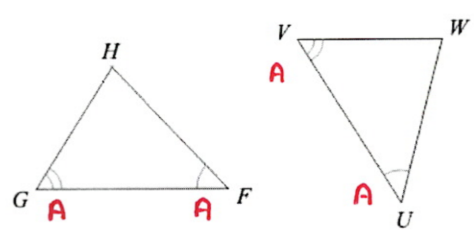


$\angle V \cong \angle N$

OR

$\angle W \cong \angle M$

8.



$GH \cong VW$

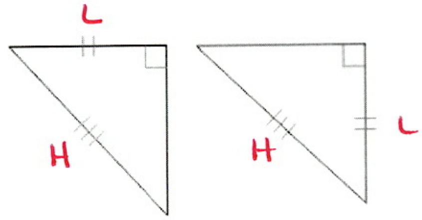
OR

$HF \cong WU$

Section 6.3 – HL Triangle Congruence

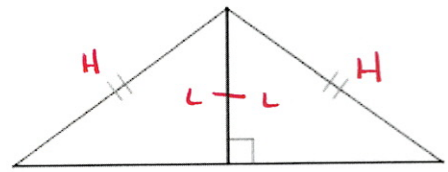
Are the two triangles congruent? If so, what statement proves them congruent. (ASA or SAS or SSS or AAS or HL)

1.



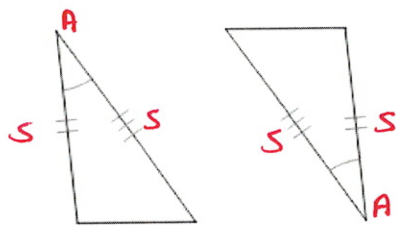
YES BY HL

2.



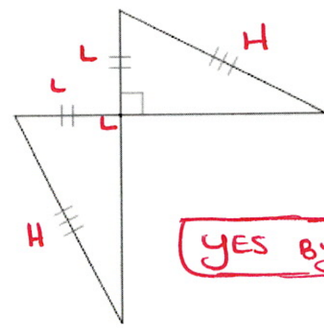
YES BY HL

3.



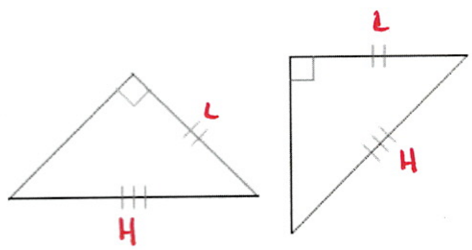
YES BY SAS

4.



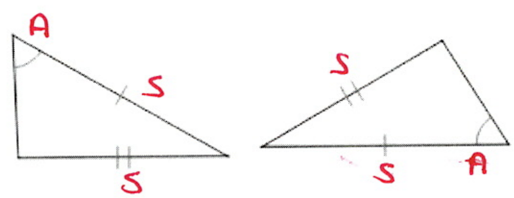
YES BY HL

5.



YES BY HL

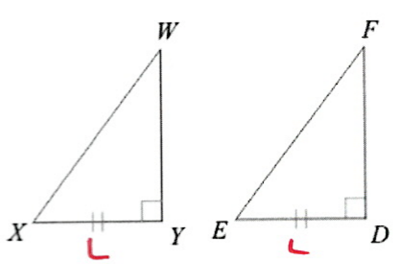
6.



NO → SSA

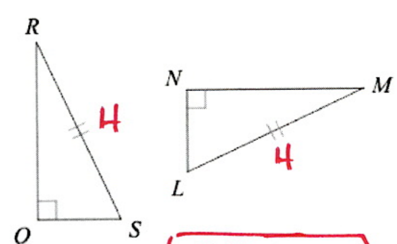
What additional information is needed to prove the two triangles congruent by HL.

7.



$WX \cong FE$

8.



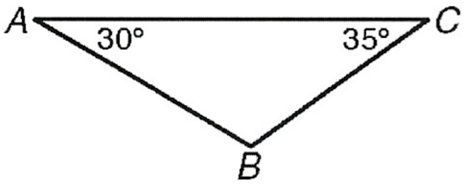
$QS \cong NL$

OR

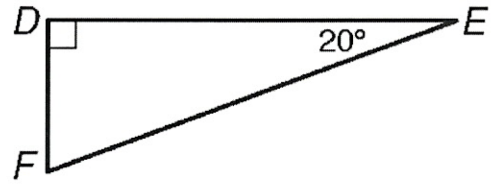
$RQ \cong MN$

Section 7.1 – Interior and Exterior Angles

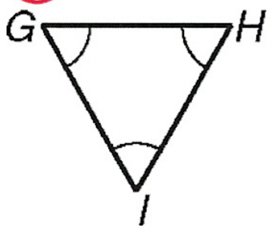
Find the measure of each angle.

1. 

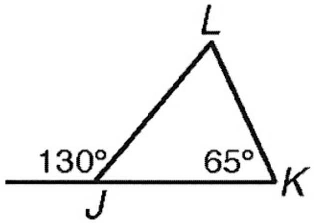
m∠B = 115 °

2. 

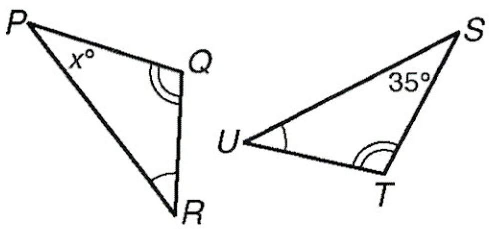
m∠F = 70 °

3. 

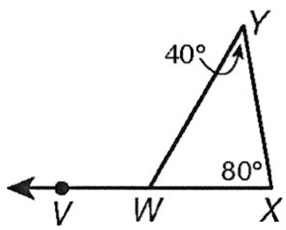
m∠G = 60 °

4. 

m∠L = 65 °

5. 

m∠P = 35 °

6. 

m∠VWY = 120 °

Use your knowledge of angle relationships to answer questions 7–11
Interior Angle Sum Theorem: (n – 2)180

7. The sum of the angle measures of a quadrilateral is 360 °.

8. The sum of the angle measures of a heptagon is 900 °.

9. The sum of the angle measures of a 13-gon is 1980 °.

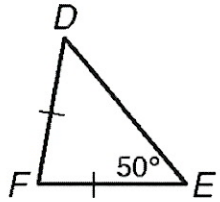
10. A polygon has an interior angle sum of 1260° The polygon has 9 sides.

11. A polygon has an interior angle sum of 720 ° The polygon has 6 sides

Section 7.2 – Isosceles and Equilateral Triangles

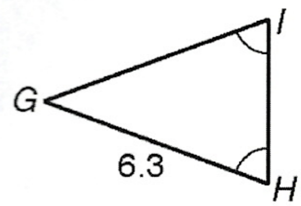
For Problems 1–6, find each value.

1.



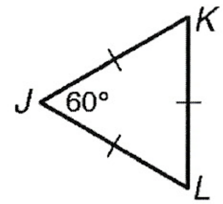
$m\angle D =$ 50 °

2.



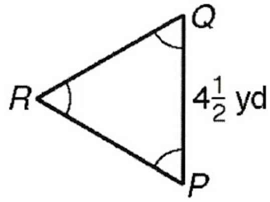
$GI =$ 6.3

3.



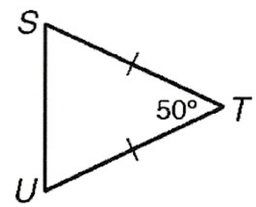
$m\angle L =$ 60 °

4.



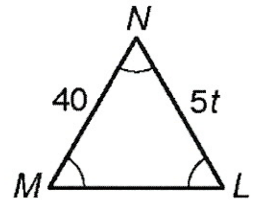
$RQ =$ $4\frac{1}{2}$

5.



$m\angle U =$ 65 °

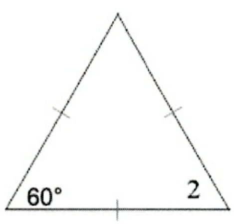
6.



$t =$ 8

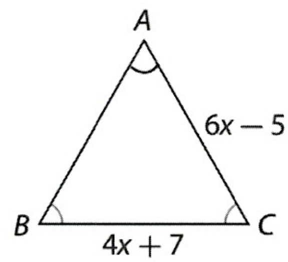
Find the value of x.

7. $m\angle 2 = 5x + 5$



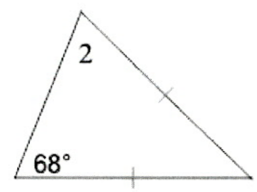
$\boxed{x = 11}$

8.



$\boxed{x = 6}$

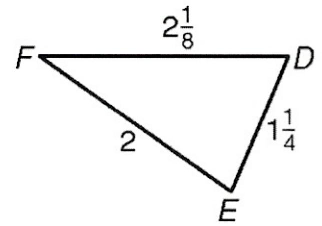
9. $m\angle 2 = 6x + 8$



$\boxed{x = 10}$

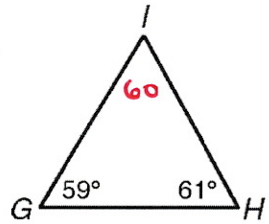
Section 7.3 – Triangle Inequalities

1. Write the angles of $\triangle DEF$ in order from **smallest to largest**.



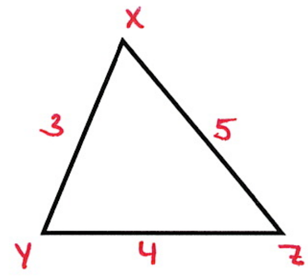
$\angle$ F $\angle$ D $\angle$ E

2. Write the sides of $\triangle GHI$ in order from **longest to shortest**.



IG GH HI

3. The sides of triangle *XYZ* are given in order below from **longest to shortest**. Name the angles from largest to smallest. (Hint: Use the triangle to the right to help you solve)



$\overline{XZ}$ $\overline{ZY}$ $\overline{YX}$

$\angle$ Y $\angle$ X $\angle$ Z

Use your knowledge of triangle inequalities to solve Problems 4–8.

4. Can three segments with lengths 8, 15, and 6 make a triangle? NO

5. Can three segments with lengths 3, 5, and 8 make a triangle? NO

6. Can three segments with lengths 7, 6, and 14 make a triangle? NO

6. Can three segments with lengths 7, 9, and 13 make a triangle? YES

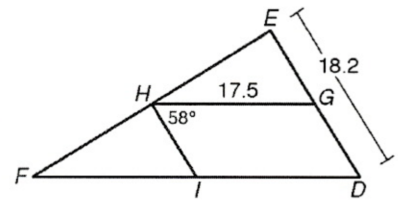
7. A triangle has the side lengths of 7 and 13. What is the range of possible side lengths? $\boxed{6 < x < 20}$

8. A triangle has the side lengths of 17 and 29. What is the range of possible side lengths? $\boxed{12 < x < 46}$

Section 8.4 – Midsegments of a Triangle

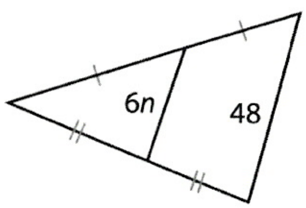
Use the figure for Problems 1–6. Find each measure.

1. HI ___9.1___
2. DF ___35___
3. GE ___9.1___
4. $m\angle HIF$ ___58°___
5. $m\angle HGD$ ___122°___
6. $m\angle D$ ___58°___

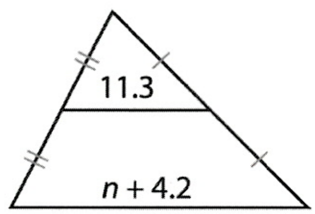


For Problems 7–9, find the value of n.

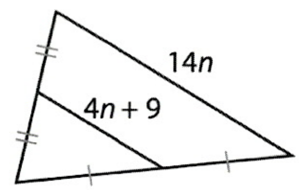
7.



8.



9.

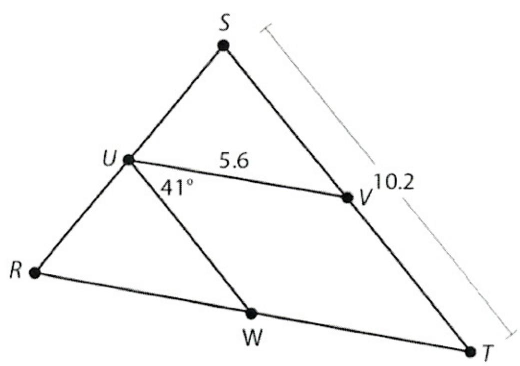


n = ___4___

n = ___18.4___

n = ___3___

Find each measure for 10-12



10. **UW** = 5.1

11. $\angle SVU$ = 41°

12. **RT** = 11.2

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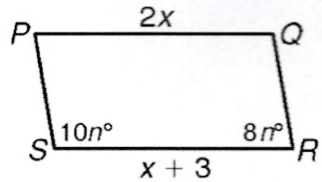
Section 9.1 – Properties of Parallelograms

PQRS is a parallelogram. Find each measure.

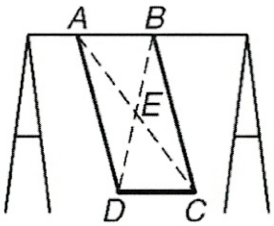


1. *RS* 6

2. m∠*S* 100

3. m∠*R* 80

The figure shows a swing blown to one side by a breeze. As long as the seat of the swing is parallel to the top bar, the swing makes a parallelogram. In ▱ *ABCD*, *DC* = 2 ft, *BE* = 4.5 ft, and m∠*BAD* = 75°. Find each measure.



4. *AB* 2

5. *ED* 4.5

6. *BD* 9

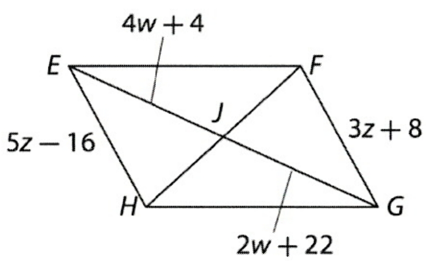
7. m∠*ABC* 105

8. m∠*BCD* 75

9. m∠*ADC* 105

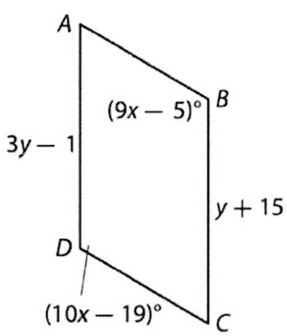
Find the value of each variable.

10.



w = 9 z = 12

11.



x = 14 y = 8

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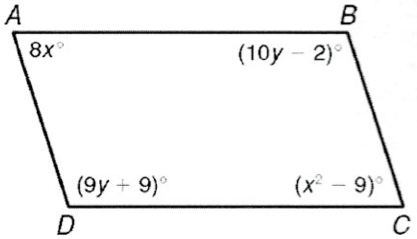
Section 9.2 – Conditions for Parallelograms

Determine whether each figure is a parallelogram for the given values of the variables. Explain your answers.

1. $x = 9$ and $y = 11$

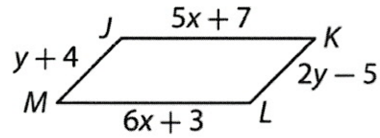


∠A = 72 ∠B = 108

∠C = 72 ∠C = 108

YES

2. $x = 4$ and $y = 9$

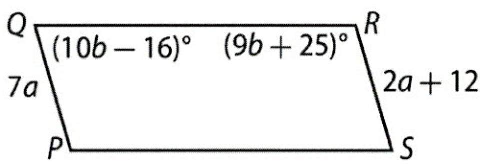


JK = 27 JM = 13

ML = 27 KL = 13

YES

3. $a = 2.4$ and $b = 9$

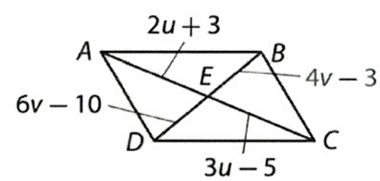


QP = 16.8 ∠Q = 74

RS = 16.8 ∠R = 106

YES

4. $u = 8$ and $v = 3.5$



AE = 19 BE = 11

CE = 19 DE = 11

YES

5. What are the conditions (5) for a quadrilateral to be a parallelogram.

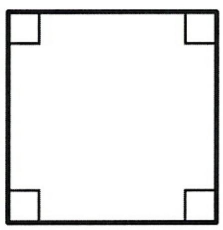
(1) OPPOSITE SIDES CONGRUENT, (2) OPPOSITE ANGLES CONGRUENT,

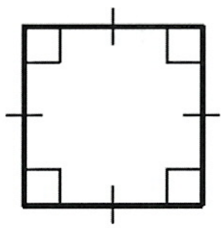
(3) CONSECUTIVE ANGLES ADD UP TO 180, (4) DIAGONALS BISECT EACH OTHER

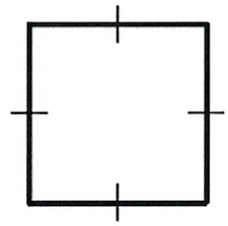
Name ____________________ Date ____________ Class ____________

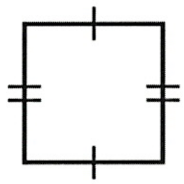
Section 9.3 – Properties of Rectangles, Rhombuses, and Squares

Tell whether each figure is a parallelogram, rectangle, rhombus, or square based on the information given. Use the most specific name possible.

1. 

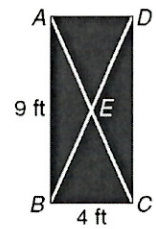
2. 

3. 

4. 

1. RECTANGLE 2. SQUARE 3. RHOMBUS 4. PARALLELOGRAM

A modern artist's sculpture has rectangular faces. The face shown here is 9 feet long and 4 feet wide. Find each measure in simplest radical form. (*Hint:* Use the Pythagorean Theorem.)



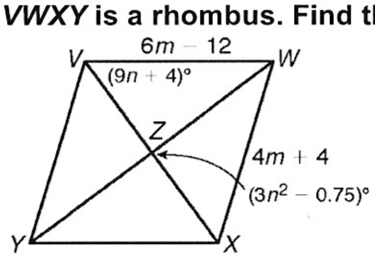
5. $DC =$ 9

6. $AD =$ 4

7. $DB =$ 9.8

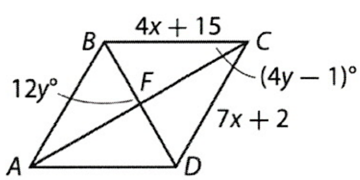
8. $AE =$ 4.9

***VWXY* is a rhombus. Find the value of the variable.**



9.) m = 8 n = 5.5

***ABCD* is a rhombus. Find each measure.**



10.) x = 4.3 y = 7.5

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Section 9.4 – Conditions of Rectangles, Rhombuses, and Squares

1. What are the conditions (2) for a parallelogram to be a rectangle.

   ① ONE ANGLE IS A RIGHT ANGLE (90°)

   ② DIAGONALS ARE CONGRUENT.

2. What are the conditions (3) for a parallelogram to be a rhombus.

   ① CONSECUTIVE SIDES EQUAL, ② DIAGONALS ARE PERPENDICULAR. ③ DIAGONALS BISECT ANGLES.

Fill in the blanks to complete each theorem.

4. If one pair of consecutive sides of a parallelogram are congruent, then the parallelogram is a RHOMBUS.

5. If the diagonals of a parallelogram are PERPENDICULAR, then the parallelogram is a rhombus.

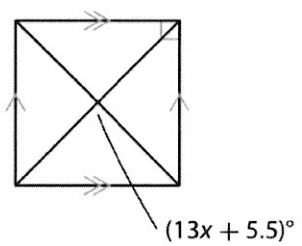
6. If the DIAGONALS of a parallelogram are congruent, then the parallelogram is a rectangle.

7. If one diagonal of a parallelogram bisects a pair of opposite angles, then the parallelogram is a RHOMBUS.

8. If one angle of a parallelogram is a right angle, then the parallelogram is a RECTANGLE.

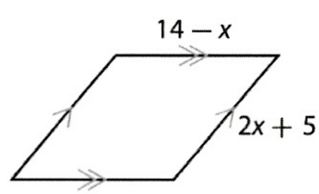
Find the value of x that makes each parallelogram the given type.

9. square



x = 6.5

10. rhombus



x = 3

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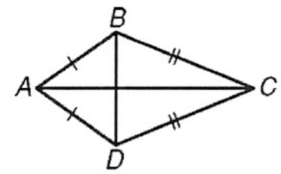
Section 9.5 – Properties & Conditions for Kites and Trapezoids



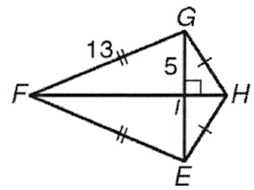
In kite *ABCD*, m∠*BAC* = 35° and m∠*BCD* = 44°.

1. m∠*ABD* 55°

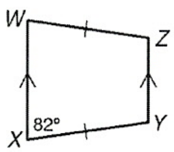
2. m∠*DCA* 22°

3. m∠*ABC* 123

4. Find FI 12

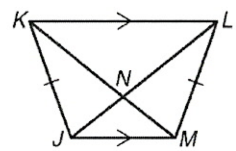


5. Find m∠*Z*.



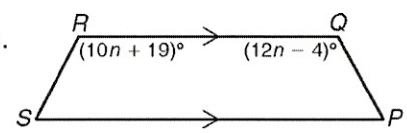
$\boxed{\angle Z = 98}$

6. *KM* = 7.5 and *NM* = 2.6. Find *LN*.



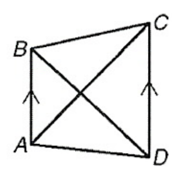
$\boxed{LN = 4.9}$

7. Find the value of *n* so that *PQRS* is isosceles.



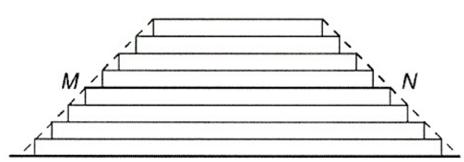
n = 11.5

9. *BD* = 7*a* – 0.5 and *AC* = 5*a* + 2.3. Find the value of *a* so that *ABCD* is isosceles.



a = 1.4

A ziggurat is a stepped, flat-topped pyramid that was used as a temple by ancient peoples of Mesopotamia.



11. The bottom is 27.3 meters long, and the top is 11.6 meters long. Find *MN*. MN is the midsegment of the trapezoid.

19.45

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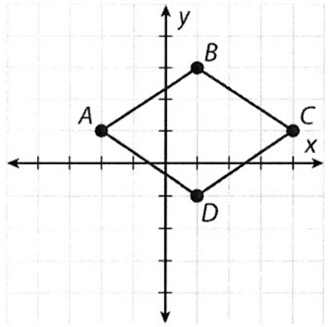
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Section 10.1 – Slopes and Parallel Lines

Prove that *ABCD* is a parallelogram.



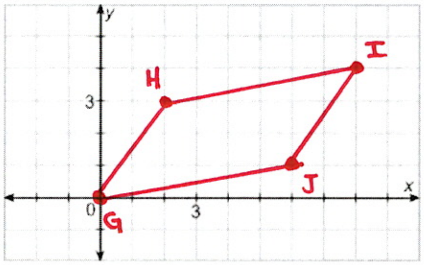
1. *ABCD* is a parallelogram if AB || CD and AD || BC.
2. Names the coordinates of *A, B, C,* and *D*.

   A (-2, 1) *B* (1, 3) *C* (4, 1) *D* (1, -1)
3. Find the slope of $\overline{AB}$. 2/3
4. Find the slope of $\overline{BC}$. -2/3
5. Find the slope of $\overline{CD}$. 2/3
6. Find the slope of $\overline{DA}$. -2/3
7. Do you have enough information to prove that *ABCD* is a parallelogram? Why or why not?

   YES OPPOSITE SIDES ARE PARALLEL

Find the missing coordinate point that forms a parallelogram. Three vertices of ▱ *GHIJ* are *G*(0, 0), *H*(2, 3), and *J*(6, 1). Use the grid to the right to complete Problems 8–13.

Plot vertices *G*, *H*, and *J* on the coordinate plane.



8. Find the rise (difference in the *y*-coordinates) from

   G to *H*. 3

9. Find the run (difference in the *x*-coordinates) from

   G to *H*. 2

10. Using your answers from Problems 8 and 9, add the rise to the *y*-coordinate of vertex *J* and add the run to the *x*-coordinate of vertex *J*.

    The coordinates of vertex *I* are (8 , 4).

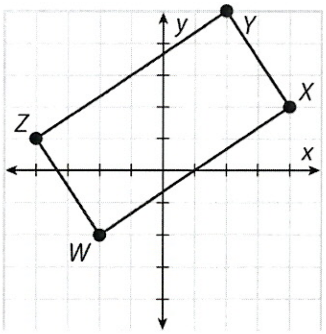
11. Plot vertex *I*. Connect the points to draw ▱ *GHIJ*.

Name ______________________ Date ______________ Class ______________

Section 10.2 – Slope and Perpendicular Lines

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Prove that ▱*WXYZ* is a rectangle.



1. Name the coordinates of *W*, *X*, *Y*, and *Z*.

   W (-2,-2) *X* (4,2) *Y* (2,5) *Z* (-4,1)

2. Calculate the slopes of each side of the parallelogram.

   $\overline{WX}$ = 2/3 $\overline{XY}$ = -3/2

   $\overline{YZ}$ = 2/3 $\overline{ZW}$ = -3/2

3. Find the products of the slopes of these segments:

   $\overline{WX}$ and $\overline{XY}$ = -1 $\overline{XY}$ and $\overline{YZ}$ = -1

   $\overline{YZ}$ and $\overline{ZW}$ = -1 $\overline{ZW}$ and $\overline{WX}$ = -1

4. Is *WXYZ* a rectangle? Why or why not?

   YES

Figure *WXYZ* has as its vertices the points *W*(2, 7), *X*(5, 6), *Y*(5, –4), and *Z*(–1, –2).

Find each slope.

6. $\overline{WX}$ -1/3 $\overline{XY}$ UNDEFINED $\overline{YZ}$ -1/3 $\overline{ZW}$ 3

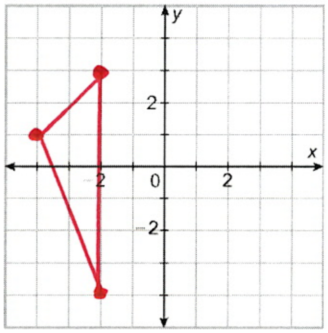
7. Is Figure *WXYZ* a rectangle? Explain your reasoning.

   NO

Section 10.5 – Area in the Coordinate Plane

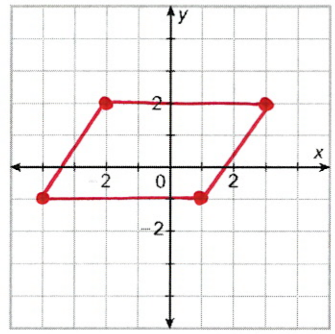
Find the area of the polygon to the nearest tenth.

1. $E(-4, 1)$, $F(-2, 3)$, $G(-2, -4)$



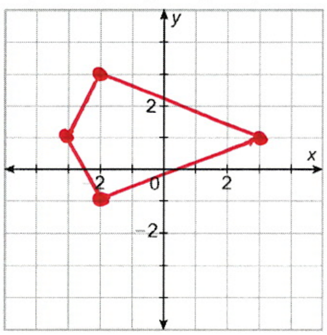
A = 7

2. $T(-2, 2)$, $U(3, 2)$, $V(1, -1)$, $W(-4, -1)$



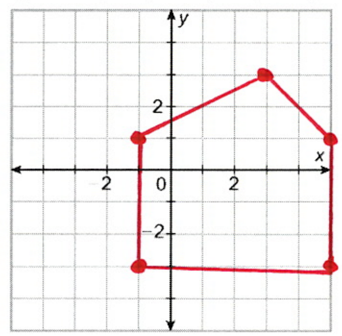
A = 15

3. $A(-2, 3)$, $B(3, 1)$, $C(-2, -1)$, $D(-3, 1)$



A = 12

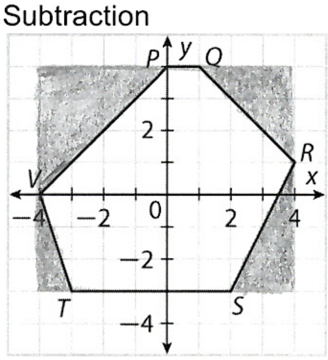
4. $P(-1, -3)$, $Q(5, -3)$, $R(5, 1)$, $S(3, 3)$, $T(-1, 1)$



A = 30

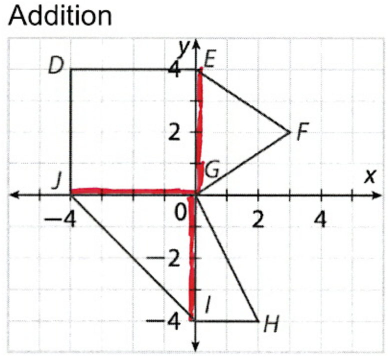
Find the area of each composite figure to the nearest tenth.

5. Subtraction



A = 38

6. Addition



A = 34