TVUSD
Geometry

Name _____

Semester 1 Re-Engagement

A new resource for your end of semester review for Geometry. This ***Re-Engagement Units*** have a unique structure and as the name implies, they offer a different paradigm than the traditional final review. That structure and reasoning are explained here.

The Structure of the Re-Engagement Units

The Overview

Each of the three courses is identically organized. This includes:

4 Days for the Problem Sets
2 Days for the Group Quiz
1 Day for last minute formative corrections
Then 2 Days for Final Exams

Which makes the last 2 weeks of the semester look something like this:

M	Tu	W	Th	F
	Problem Sets Day 1	**Problem Sets Day 2**	**Problem Sets Unit 3**	**Problem Sets Unit 4**
Group Quiz A	**Group Quiz B**	**Formative Corrections**	**Finals**	**Finals**

The Problem Sets

The first phase of the Re-Engagement Unit is the problem sets. These sets are specifically designed to embed questions similar to the final, but also include problems that revisit the conceptual underpinnings of the content (dig deeper) and challenge students critical thinking abilities (reach higher). The Problem Sets are segmented by the units in which they were taught (aligned to UPO's). They are intended to be worked through in collaborative groups. A new set or sets will be given each day.

The suggested schedule for The Problem Sets is as follows....

	Tu	W	Th	F
Geometry	**Transformations & Theorems and Postulates**	**Constructions & Parallel Lines**	**Triangle Congruency & Properties**	**Quadrilaterals & Coordinate Geometry**

The Group Quiz

The Group Quiz is designed to prepare for the Final Exam questions without offering a "practice final with the numbers changed and the multiple choices removed." Since it is lengthy like the final, it will take two days (thus parts A & B), with students being allowed to take it home to finish. Even if a teacher chooses not to give the Problem Sets, the Group Quiz can still be given as an alternative to the conventional Practice Exam.

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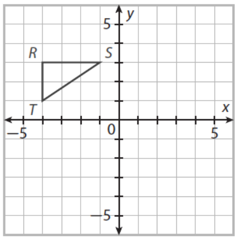
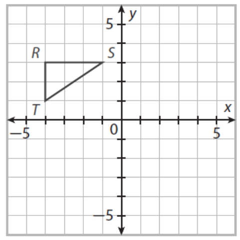
Transformations

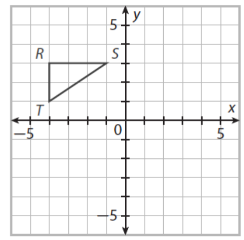
1. Apply each rule to the given pre-image, and describe the transformation.
   a) (x, y) → (-y, x)   b) (x, y) → (x + 3, y - 4)   c) (x, y) → (x, -y)

   ________________   ________________   ________________

   ________________   ________________   ________________





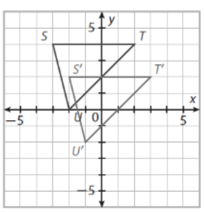


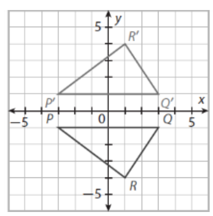
2. Which one(s) of the above results is a congruent shape by rigid motion? ___________

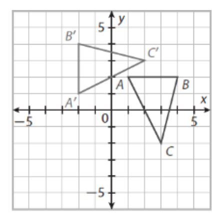
3. Write the rule for each transformation shown, and describe the transformation.
   a) (x, y) → (,)   b) (x, y) → (,)   c) (x, y) → (,)

   ________________   ________________   ________________

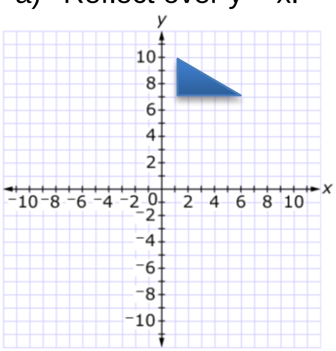
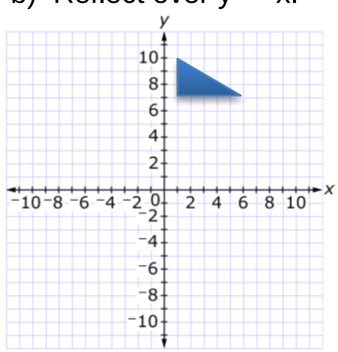
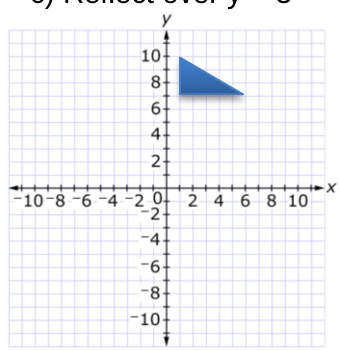
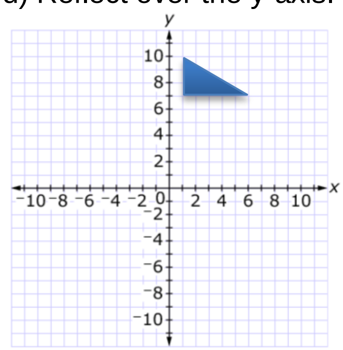
   ________________   ________________   ________________







4. Perform the indicated transformation on the given pre-image with vertices (1, 10), (1, 7) & (6, 7).
   a) Reflect over y = x.   b) Reflect over y = -x.   c) Reflect over y = 3   d) Reflect over the y-axis.

5. Match the rule to the description of the transformation.

_____ Reflection over the y-axis
_____ Reflection over the x-axis
_____ Reflection over the line y = x
_____ Reflection over the line y = -x
_____ Rotation 90° clockwise
_____ Rotation 90° counterclockwise
_____ Rotation 180°

A. (x, y) → (x, -y)
B. (x, y) → (-y, x)
C. (x, y) → (y, x)
D. (x, y) → (-x, y)
E. (x, y) → (y, -x)
F. (x, y) → (-y, -x)
G. (x, y) → (-x, -y)

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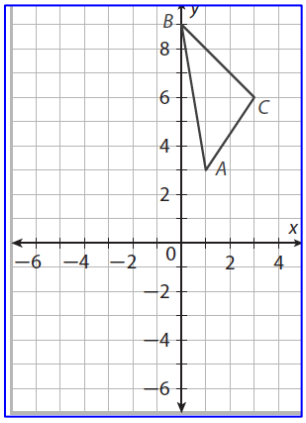
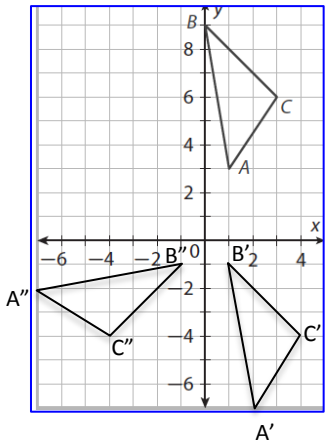
6. a) Perform the indicated sequence of transformations on the given pre-image, *below left*:
Rotate 90° counterclockwise about the origin, then reflect across the x-axis.



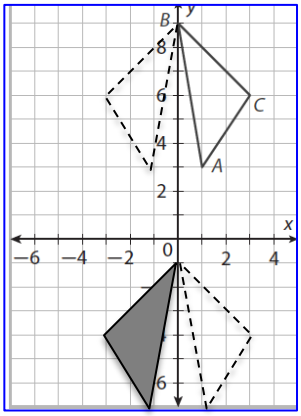


b) Describe the sequence of transformations that will result in the final image, *above right*.

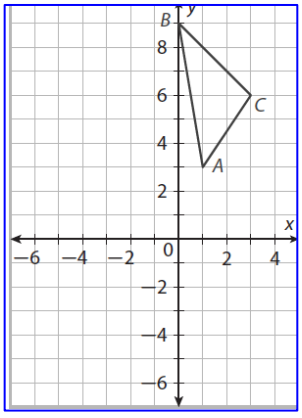
7. Lavern claims that "*any sequence of transformations involving one reflection over an axis and one translation will result in the same image*," no matter in which order the transformation are executed. (reflection, then translation vs translation first, then reflection). She supports her work as follows.

I. Reflection first: (x, y) → (-x, y) → (x, y – 10) → (-x, y – 10)

II. Translation first: (x, y) → (x, y – 10) → (-x, y) → (-x, y – 10)



Shirley claims that Lavern's conjecture is not always true. Offer a counterexample for Shirley to use in order to debunk Lavern's claim, or prove that Lavern's statement is always true.



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Theorems and Postulates

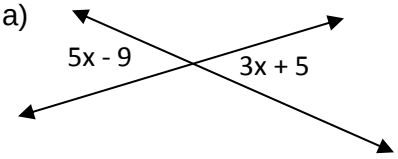
8. a) Draw a counterexample for the following statement: For all points A, B and C, *AB + BC = AC.*

   b) What condition must be true in order for AB + BC = AC?

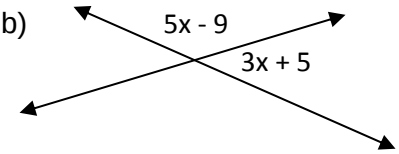
9. Hank claims that "*the square root of a number is always even*." Do you agree or disagree with Hank's conjecture. Support your position.

10. Given the the conditional statement: *If a car is a Mustang, then the car is yellow*,
    a) give an instance, b) give a counterexample, if any, c) and write the converse.

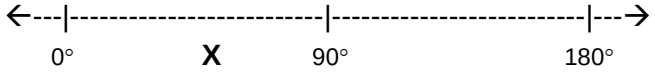
11. Solve for x: a)



b)



12. On the number line below, place *C*, to represent the complement of *x*, and *S*, to represent its supplement.



13. Describe the the difference between a line, a segment and a ray. Draw an example of each.

14. Draw and lable an example of each of the following:
    a) complementary angles that are not adjacent

    b) supplementary angles that are not a linear pair

    c) Two coplanar lines that are neither parallel, nor perpendicular

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15. Draw and/or write an example of each of the following:

a) Linear Pair Postulate

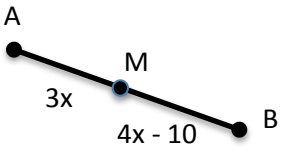
b) Vertical Angle Theorem

c) Segment Addition postulate

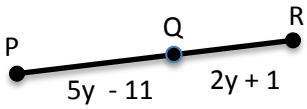
d) Angle Addition Postulate

16. Find the indicated measure

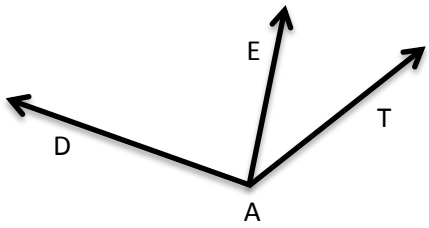
a) AB, given M is the midpoint,



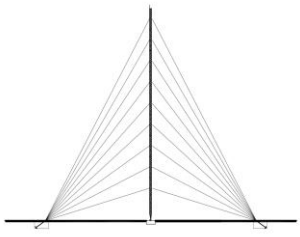
b) PQ, given PR = 32



c) m∠EAT, given m∠DAE = 85°, and m∠DAT = 115°



17. A pole is held vertical by guy wires anchored equal distance from the pole as shown in the diagram. According to the Perpendicular Bisector Theorem, what can you determine to be true?



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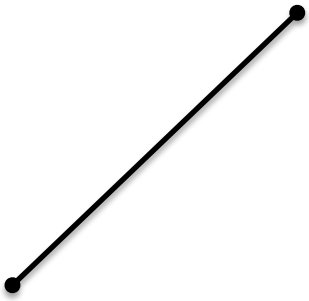
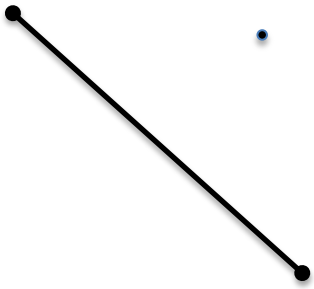
Constructions

18-21) Construct the following:

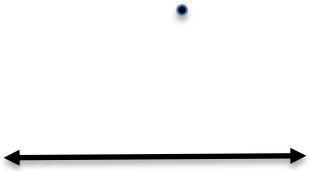
18. Perpendicular bisector



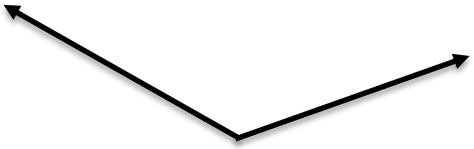
19. Perpendicular line through a point off the line



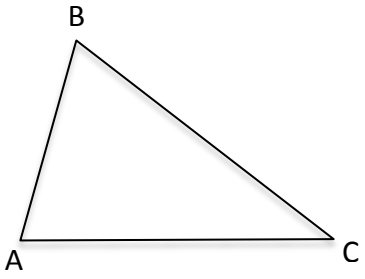
20. Parallel line through a point off the line



21. Bisect an angle



22. Construct the three medians of the triangle and show that they are concurrent.



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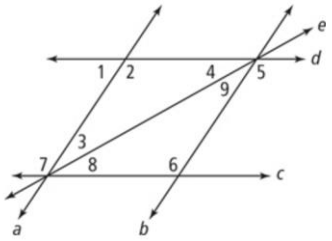
Parallel & Perpendicular Lines and Transversals

23. Give that d || c, a || b, m∠4 = 30° and m∠7 = 100°, Find the measure of all other designated angles.



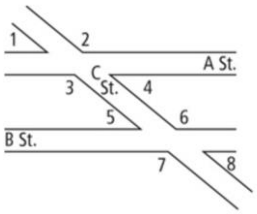
m∠1 = _____° m∠5 = _____°

m∠2 = _____° m∠6 = _____°

m∠3 = _____° m∠8 = _____°

m∠9 = _____°

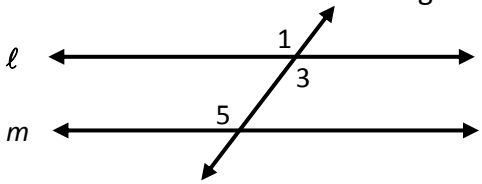
24. Streets A & B are parallel. What is the sum of ∠2, ∠3, ∠5, and ∠8? _____



25. Arrange the given statements & reasons to complete the proof of the Alternate Interior Angle Theorem.

G: ℓ // m

P: ∠3 ≅ ∠5



Statements	Reasons
1.	1.
2.	2.
3.	3.
4.	4.

Transitive Property

∠3 ≅ ∠5

Corresponding Angles Postulate

ℓ // m

Vertical Angles Theorem

Given

∠1 ≅ ∠3

∠1 ≅ ∠5

26. Draw and label a diagram that demonstrates the given types of angles.

a) vertical angles b) linear pair c) corresponding angles

d) alternate interior angles e) alternate exterior angles f) same-side interior angles (consecutive)

27. Draw and label a single diagram for which all of the following four statements are true.

i) **∠1 & ∠2 are corresponding, and congruent**

ii) **∠2 & ∠3 are corresponding, but not congruent**

iii) **∠3 & ∠4 are alternate interior, and congruent**

iv) **∠4 & ∠5 are vertical**

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Triangle Congruency

28. Draw and/or write an example of each of the following:

a) Alternate Interior Angles Theorem

b) Definition of Angle Bisector

c) Substitution Property

d) Transitive Property

e) Reflexive Property

f) Definition of Paralleogram

g) Definition of Midpoint

h) SSS Postulate

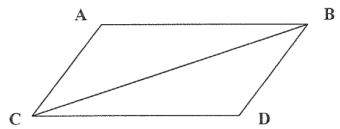
i) SAS Theorem

j) ASA Theorem

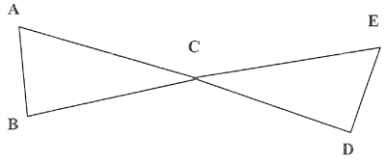
k) AAS Theorem

29. Match a Triangle Congruency Theorem/Postulate to each Diagram (Add additional markings if necessary.)

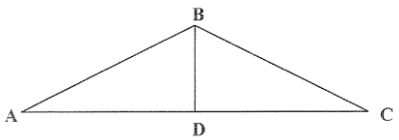
a) $\overline{AC} \parallel \overline{BD}$, $\overline{AC} \cong \overline{BD}$



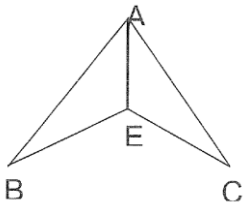
b) C is the midpoint of $\overline{BE}$, $\angle B \cong \angle E$



c) D is the midpoint of $\overline{AC}$, $\overline{AB} \cong \overline{CE}$



d) $\overrightarrow{AE}$ bisects $\angle BAC$, $\angle B \cong \angle C$



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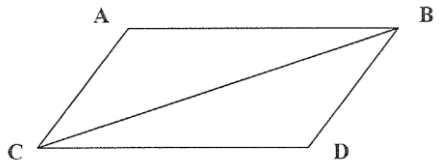
30. a) G: ABCD is a parallelogram
P: $\angle A \cong \angle D$

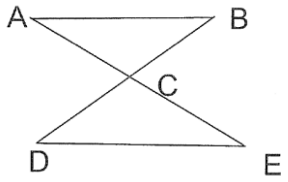


Statements	Reasons
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.

b) What did you prove above?

31. Regarding the following diagram, match each set of givens to the triangle congruency theorems and postulates that will be used to prove the two triangles are congruent. The theorems and postulates may be chosen more than once or not at all.

SSS SAS AAS ASA



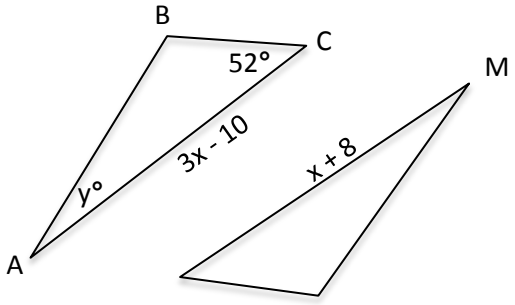
a) AB || ED
C is the midpoint of DB
_____

b) C is the midpoint of AE
DC ≅ CB
_____

c) AC ≅ EC
$\angle D \cong \angle B$
_____

d) AB || ED
AB ≅ ED
_____

32. $\Delta ABC \cong \Delta MNP$. Solve for x & y.



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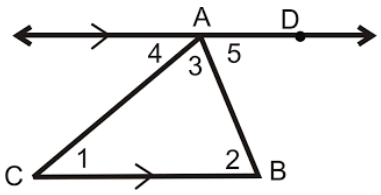
P 100°
N

Triangle Properties

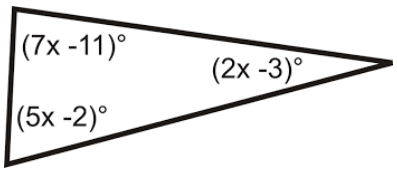
33 a) Prove the Triangle Sum Theorem.

G: $\overline{AD}$ || $\overline{CB}$

P: m∠1 + m∠2 + m∠3 = 180



b) Find the measure of each angle.

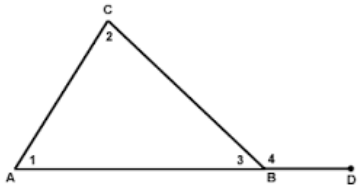


Statements	Reasons
1.	1.
2. m∠4 + m∠3 + m∠5 = 180	2. Angle Addition postulate
3. m∠1 = m∠4	3.
4.	4. Alternate Interior Angle Th.
5.	5. Substitution

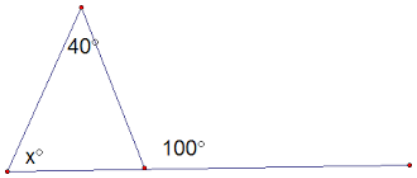
34. a) Prove the Remote Exterior Angle Theorem

G: ΔABC

P: m∠1 + m∠2 = m∠4



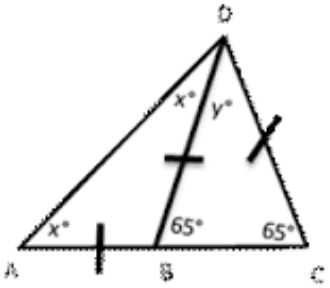
b) Solve for x.



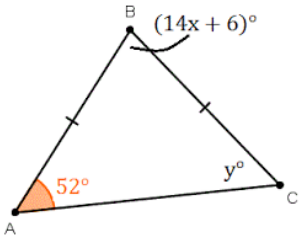
Statements	Reasons
1.	1.
2. m∠1 + m∠2 m∠3 = 180	2. Triangle Sum Theorem
3.	3.
4.	4.
5.	5.

35. a) Draw an example of the Isosceles Triangle Theorem. Include the measurements of all 6 parts.

b) Solve for x & y.



c) Solve for x & y.



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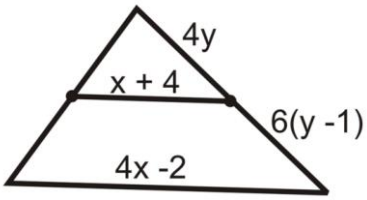
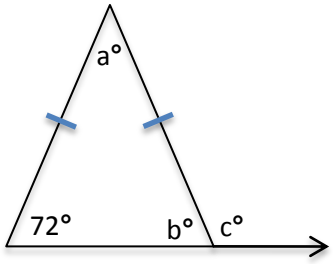
36. a) Draw an example of the Midsegment Theorem. Include all pertinent measurements.

b) Shown is an example of a midsegment of a triangle. Solve for x & y.



37. Find a, b & c.



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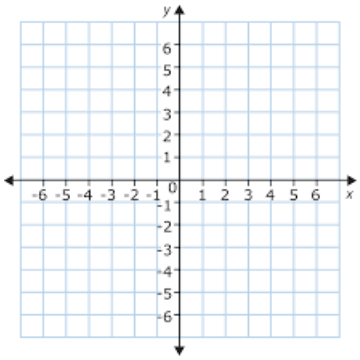
Coordinate Geometry

38. Given A(-2, 1) B(2, 3) and C(4, -2), write the equation of the line that is

a) parallel to $\overleftrightarrow{AB}$, through C

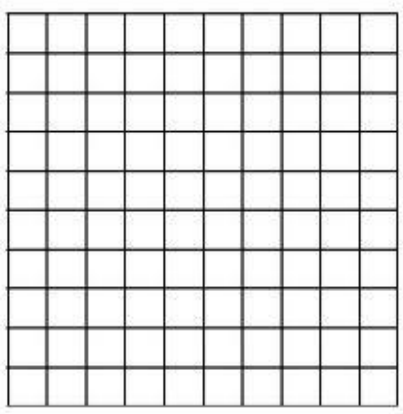
b) perpendicular to $\overleftrightarrow{AB}$, through C.



c) Check your answers by graphing.

39-41) Given QUAD *Q(0, 1), U(0, 5), A(4, 7), D(4, 3).*

39. Find the perimeter of QUAD.



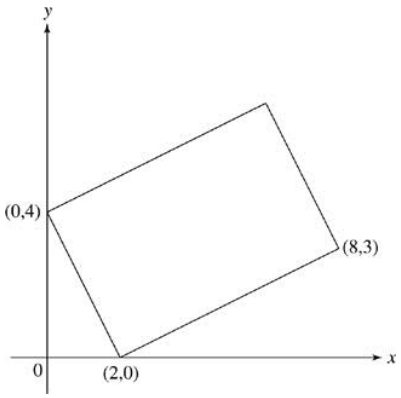
40. Prove that QUAD is a parallelogram.

41. a) Show that the diagonals of QUAD bisect each other.

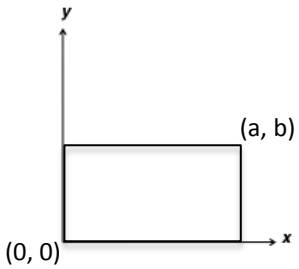
b) Determine, algebraically, whether or not the diagonals are perpendicular.

42. Find the missing coordinates.

a)



b)



43. Given the endpoint of a segment E(-2,4) and midpoint M(1,1), determine the coordinates of the other midpoint.

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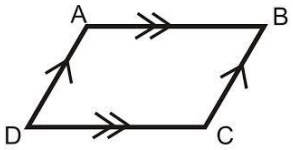
Quadrilaterals

44. Identify each quadrilateral according to it's markings.

a) _____ b) _____ c) _____ d) _____

e) _____ f) _____ g) _____ h) _____

45. In the parallelogram below, given that m∠D = 65°, find the measure of the other three angles.



46. For rectangle HOME,

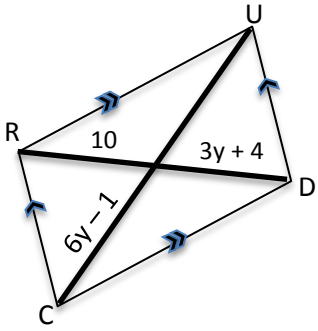
a) Draw HOME, including diagonals HM & OE.

b) Given HM = 3x + 5 & OE = 5x + 1, find HM & OE.

47. Circle all the properties below that are true of all parallelograms.

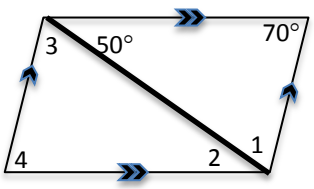
Opposite side congruent	Opposite sides parallel	Diagonals bisect each other
Opposite angels congruent	Diagonals are perpendicular	Consecutive angles are congruent
Diagonals congruent	Adjacent sides are perpendicular	Adjacent sides are congruent

48. Find the length of diagonal CU.



49. Find each designated angle.

m∠1 = ____, m∠2 = ____, m∠3 = ____, m∠4 = ____



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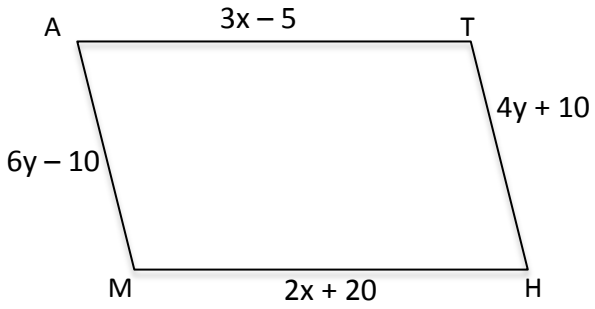
50. *Given parallelogram MATH, with m∠H = (2w + 30)° and m∠A = (6w - 50)°, find:*

a) m∠MAT =

b) m∠AMH =

c) the perimeter of MATH = _____



51. Draw and name a quadrilateral for which the given conditions are true.

a) Diagonals are congruent, but not always perpendicular.

_____

b) Diagonals are perpendicular, but not always congruent.

_____

c) Diagonals bisect each other, and are congruet as well as perpendicular.

_____

d) Diagonals bisect each other, but are not always congruent.

_____