

Geometry Honors Semester 1 Final Exam Review

Name: _____

Date: _____ Period: _____

Formulas:

1. Slope -
2. Midpoint -
3. Distance -
4. Pythagorean Theorem –
5. Point – slope Form –
6. Slope – Intercept Form –
7. Geometric Mean –

Transformations:

1. Translation –
2. Reflections –
3. Rotations –
 - a. $R_{0, 90^\circ}$
 - b. $R_{0, -90^\circ}$
 - c. $R_{0, 180^\circ}$
4. Rotational Symmetry –

Concurrency:

1. How to find Altitude (orthocenter) –
2. How to find Median (centroid) –
3. How to find \perp bisector (circumcenter) –
4. How to find Angle Bisector (incenter) -

Theorems:

- All radii of a circle are congruent
- If two lines are parallel, then their slopes are equal
- If two lines are perpendicular each line's slope is the opposite reciprocal of the other's
- The sum of the measures of the angles in a triangle is 180 degrees
- The measure of an exterior angle of a triangle is equal to the sum of the measures of the remote interior angles
- A segment joining the midpoints of two sides of a triangle is parallel to the 3rd side, and its length is one half the length of the 3rd side (Triangle Midsegment Theorem)
- The median of a trapezoid is parallel to the bases and its length is the average of the lengths of the base. (Trapezoid Median Theorem)

Definitions:

1. Complementary –
2. Supplementary –
3. Bisect –
4. Vertical Angles –
5. Perpendicular –

Triangle Congruence Criterion:

Triangle Similarity Criterion:

Type of Sentences:

1. Conditional –
 - a. Hypothesis –
 - b. Conclusion –
2. Converse –
3. Inverse –
4. Contrapositive –
5. Conjecture –
6. Bi – Conditional –

Properties and Definitions

Quadrilaterals:

Parallelogram:

- 1.
- 2.
- 3.
- 4.
- 5.

Rectangle:

- 1.
 - 2.
- Plus all 5 properties of the Parallelogram

Rhombus:

- 1.
 - 2.
 - 3.
- Plus all 5 properties of the Parallelogram

Square:

- All 5 properties of the Parallelogram
- 2 properties of the Rectangle
- 3 properties of the Rhombus

Kite:

- 1.
- 2.
- 3.
- 4.
- 5.

Trapezoid:

Isosceles Trapezoid:

- 1.
- 2.

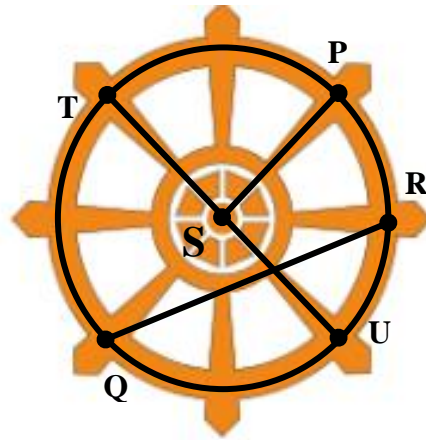
Ways to prove Quad. is a parallelogram

- 1.
- 2.
- 3.
- 4.
- 5.

UNIT 1 – ACTIVITIES – 1 – 8

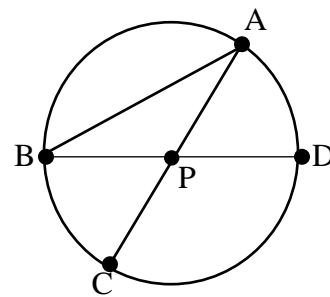
1. Identify the following on the given picture:

- a. Chord:
- b. Diameter:
- c. Radius:
- d. Center:



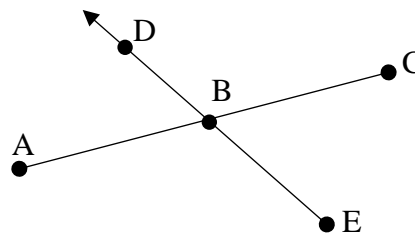
2. Use this diagram.

- a. How many radii are shown? Name them.
- b. How many diameters are shown? Name them.
- c. How is a chord similar to a diameter?
- d. How is a chord different from a diameter?
- e. How is a radius different than a diameter?

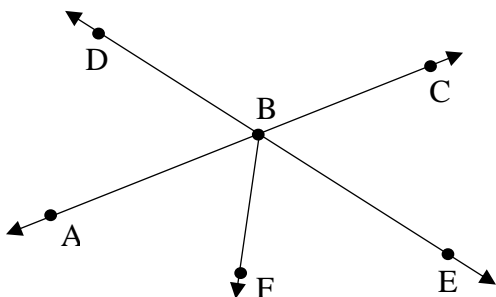


3. Which describes the geometric figures in the diagram?

- A. \overrightarrow{DE} intersects \overline{AC} at point B
- B. \overleftrightarrow{ED} intersects \overleftrightarrow{AC} at point B
- C. \overrightarrow{ED} intersects \overline{AC} at point B
- D. \overleftrightarrow{DE} intersects \overleftrightarrow{AC} at point B



4. Name angle pairs in the figure that are adjacent and supplementary.



5. Consider the conjecture shown:

Conjectures:

If two angles are complementary, then both angles must be acute.

If two angles are acute, then their sum must be less than 180° .

Which is a viable argument for these conjectures? **CHECK ALL THAT APPLY.**

- A. Given $\angle 1$ and $\angle 2$ are acute angles; therefore, they are complementary
- B. Given $\angle 1$ and $\angle 2$ are acute angles; therefore, their sum is less than 180° .
- C. Given $\angle 1$ and $\angle 2$ are complementary; therefore, they are both acute angles.
- D. Given $\angle 1$ and $\angle 2$ are complementary; therefore, their sum is less than 180° .
- E. Given $\angle 1$ and $\angle 2$ have a sum less than 180° ; therefore, they are both acute angles.
- F. Given $\angle 1$ and $\angle 2$ have a sum less than 180° ; therefore, they are complementary.

6. Consider the conditional statement, find a counterexample.

Conditional: If $2x + 5 > 7$, then $x < 1$.

7. Identify the hypothesis and conclusion of the conditional statement.

Conditional: If it snows, then I will make a snowman.

8. Suppose Q is the midpoint of \overline{PR} , $PQ = x + 10$, and $QR = 4x - 2$. What is the value of PR ?

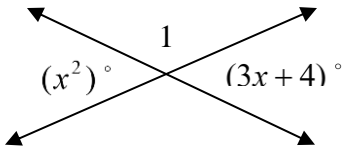
9. Suppose point D is in the interior of $\angle ABC$, $m\angle ABC = 12x - 110$, $m\angle ABD = 3x + 40$, and $m\angle DBC = 2x - 10$. What is $m\angle ABC$?

10. Julie is given two points (x, y) and (w, z) . **Explain** the process you would use to find the **distance** between the two points.

11. The distance between P and N is 5 units. Point P has coordinates (2, 3). The x-coordinate of point N is 5. What are the possible values of the y-coordinate of N ? (Hint : use distance formula)

12. Suppose the midpoint of \overline{RT} is $M = (3,0)$. If point R has the coordinates $(-1,4)$, what are the coordinates of point T?

13. Find the measure of $m\angle 1$.

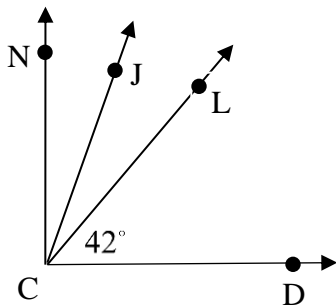


14. Use the diagram shown.



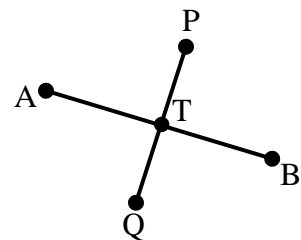
What is the justification for the statement that $PQ + QR = PR$?

15. If $\overline{NC} \perp \overline{DC}$ and \overline{CJ} bisects $\angle NCL$, find $m\angle NCL$.

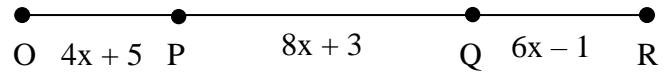


16. In the diagram shown, $AB \perp PQ$. If $PT = TQ$, which statement is true?

- A. $AT = TB$
- B. \overline{PQ} is the perpendicular bisector of \overline{AB}
- C. \overline{AB} is the perpendicular bisector of \overline{PQ}
- D. \overline{PT} is the perpendicular bisector of \overline{AB}

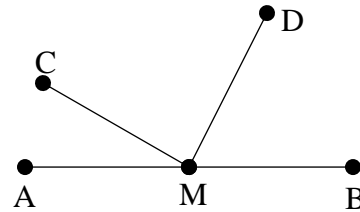


17. In the diagram, $\overline{OP} \cong \overline{QR}$. Find the length of \overline{PR} .



18. Suppose \overline{CM} and \overline{DM} intersect \overline{AB} as shown below.

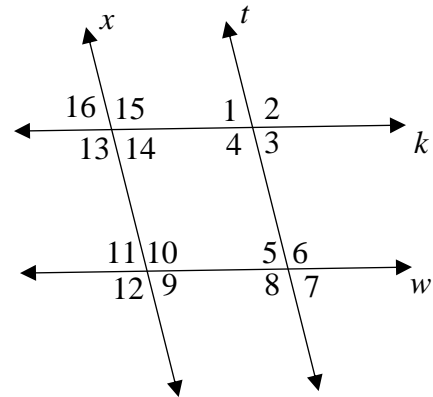
Allison states $\angle AMC + \angle CMD + \angle DMB = \angle AMB$.
State the postulate that justifies this statement.



19. Billy is working on a proof given $x \parallel t$ and $k \parallel w$ as shown.

He wants to write a statement that can be justified using **only** the **Corresponding Angles Postulate**.
Which statement could he write? **CHECK ALL THAT APPLY.**

- A. $\angle 2 \cong \angle 4$
- B. $\angle 2 \cong \angle 6$
- C. $\angle 2 \cong \angle 8$
- D. $\angle 2 \cong \angle 10$
- E. $\angle 2 \cong \angle 12$
- F. $\angle 2 \cong \angle 15$

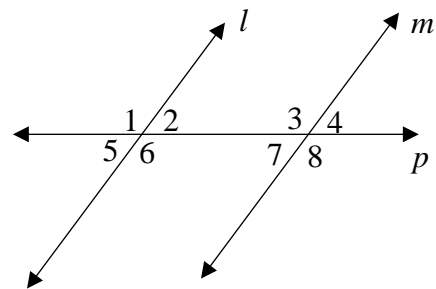


20. Given the diagram in #19, $x \parallel t$ and $k \parallel w$, if $m\angle 16 = 75^\circ$, then find $m\angle 8$.

21. In the diagram shown, lines l and m are parallel.

State if each pair of angles does or does **NOT** represent corresponding angles:

- a. $\angle 1$ and $\angle 4$
- b. $\angle 5$ and $\angle 7$
- c. $\angle 6$ and $\angle 8$
- d. $\angle 2$ and $\angle 4$



22. Write the equation of the line that passes through $(6, -2)$ and is parallel to the line $2x + y = 3$.

23. Write the equation of the line that passes through $(-2, -3)$ and is perpendicular to the line $x + y = 2$.

UNIT 2 – ACTIVITIES 9 – 16

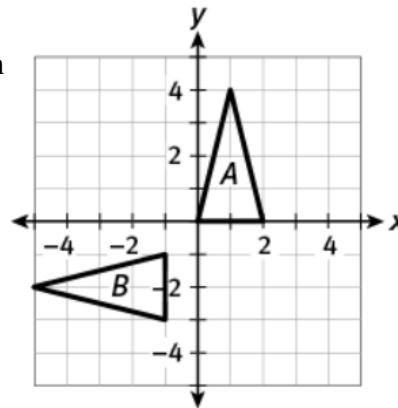
24. A polygon that goes undergoes a combined transformation $T_{(3,2)}(R_{0,90^\circ})$. The vertex $(5,2)$ of the polygon maps to what final image?

25. Suppose $\triangle ABC \cong \triangle LMN$, and the side lengths of $\triangle ABC$ are shown in the table below.

What is the longest side in $\triangle LMN$?

Side	Length (cm)
\overline{AB}	5.2
\overline{BC}	8.4
\overline{AC}	7.8

26. Triangle A and its rotated image B are shown on the grid.
If the center of rotation is $(1, -2)$, write the correct notation for the rotation.



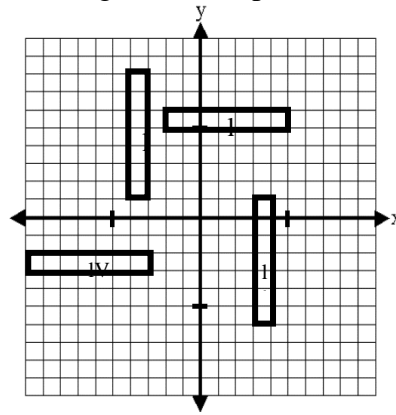
27. A point is located at $(-4, 3)$. Which reflection maps that point to $(10, 3)$?

- A. a reflection across the line $x = 3$
- B. a reflection across the line $x = 7$
- C. a reflection across the line $x = 10$
- D. a reflection across the line $y = 3$

28. A regular polygon has a rotational symmetry with an angle of 36° . Identify the polygon it's referring to.

29. Use the diagram shown. Which pair of figures can represent the pre-image and image is a translation?

- A. I and IV
- B. II and III
- C. III and IV
- D. I and III



30. A translation of a rectangle under the transformation $(x, y) \rightarrow (x - 1, y + 3)$ is recorded in the table below.

Fill in the corresponding table if the image is then moved an additional 3 units right and 2 units up.

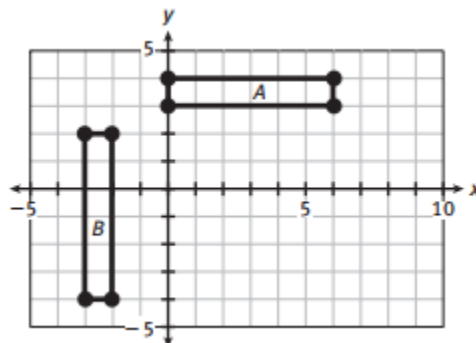
Point	Preimage	Original translation Image	Additional translation image
A	(2,-1)	(1,2)	
B	(2, -3)	(1, 0)	
C	(6,-1)	(5, 2)	
D	(6,-3)	(5, 0)	
	(x, y)		

31. Given the transformation recorded in the table below state the transformation function that maps the preimage to image.

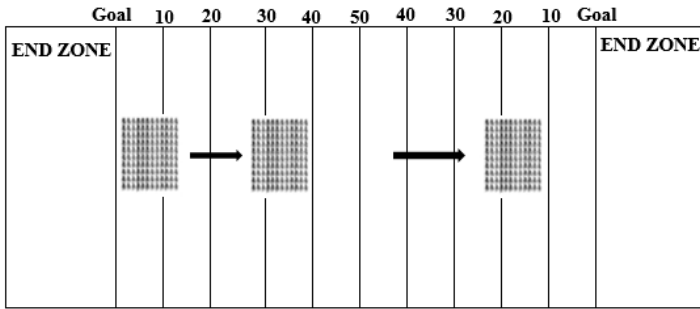
Point	Preimage	Original translation Image
A	(2,-1)	(9, -12)
B	(2, -3)	(9, -14)
C	(6,-1)	(13, -12)
D	(6,-3)	(13, -14)

32. Which combination shows that rectangles A and B are congruent?

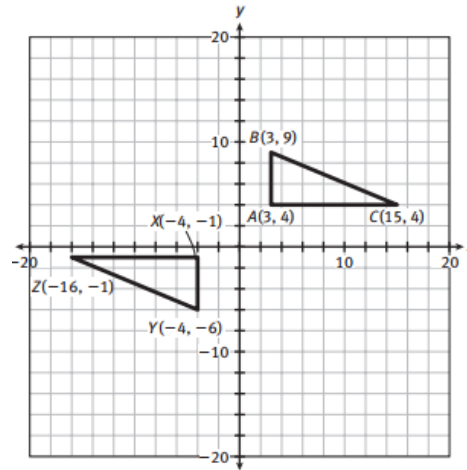
- A. $R_{(0, 3), 90^\circ}$ ($T_{(-3, 0)}$ (A))
- B. $T_{(-2, -7)}$, ($R_{(0, 3), 90^\circ}$ (A))
- C. $T_{(-2, -7)}$, ($R_{(0, 3), 90^\circ}$ (B))
- D. $T_{(-2, -7)}$, ($R_{(0, 3), -90^\circ}$ (A))



33. The band is practicing a new rigid transformation halftime routine. What happens to the distance between each band member as they move?

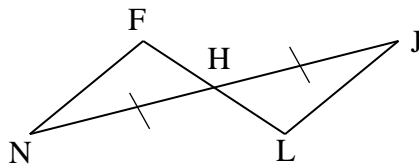


34. Explain why $\triangle ABC$ and $\triangle XYZ$ are right triangles.

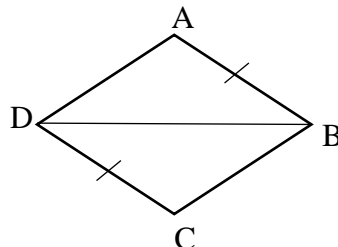


35. Suppose $\triangle QRS \cong \triangle TUV$ are congruent right triangles such that $\angle R$ is a right angle and $\angle V = 35^\circ$. What is the measure of $\angle Q$?

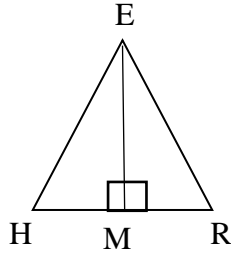
36. What additional information need to be given to develop the proof that $\triangle FHN \cong \triangle LHJ$ by ASA congruence criteria?



37. What additional information need to be given to develop the proof that $\triangle ABD \cong \triangle CBD$ by SAS congruence criteria?



38. What additional information need to be given to develop the proof that $\triangle EMH \cong \triangle EMR$ by HL congruence criteria?



39. Which statement could be used in a proof with the reason CPCTC after proving $\triangle ABC \cong \triangle EFG$?
Check all that apply.

_____ $\overline{AC} \cong \overline{EG}$

_____ $\overline{AB} \parallel \overline{EF}$

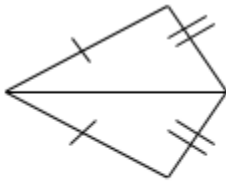
_____ $\overline{BC} \cong \overline{FG}$

_____ $\angle BCA \cong \angle FGE$

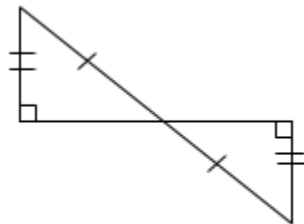
_____ $\angle CBA \cong \angle GEF$

40. Given the information provided, name the method, if any, that can be used to prove the triangles congruent:

a.



b.



c.



d.

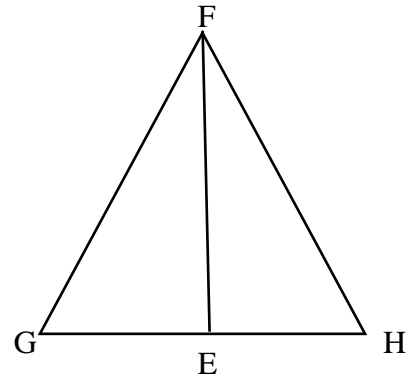


41. When do you use CPCTC?

42. Write a two column proof:

Given: Isosceles $\triangle FGH$ with base \overline{GH} and \overline{FE} bisects $\angle GFH$

Prove: E is the midpoint of GH

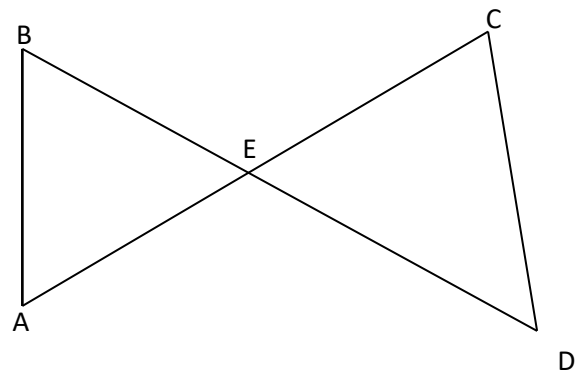


43. Rewrite #42 as a flowchart proof:

44. Write a flow chart proof and two column proof:

Given: E the midpoint of \overline{BD} and $\overline{AE} \cong \overline{EC}$

Prove: $\triangle AEB \cong \triangle CED$

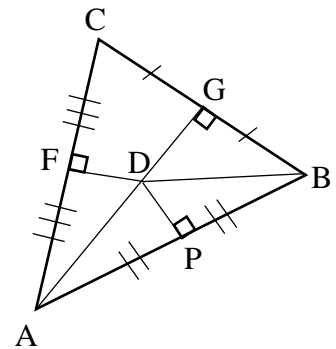


45. Given $\triangle ABC$:

a. Name the point of concurrency at point D.

b. What do you know about segments \overline{AD} and \overline{DB} ? Why do you know this?

c. Given $AD = 2x - 9$ and $DB = 27$, find the value of x .



46. The equations shown represent two altitudes of a triangle.

$$y = x + 1 \quad \text{and} \quad y = -2x - 1$$

What are the coordinates of the orthocenter of the triangle?

A. $(0, 1)$

B. $(2, 3)$

C. $\left(-\frac{2}{3}, \frac{1}{3}\right)$

D. $\left(-\frac{2}{3}, -\frac{1}{3}\right)$

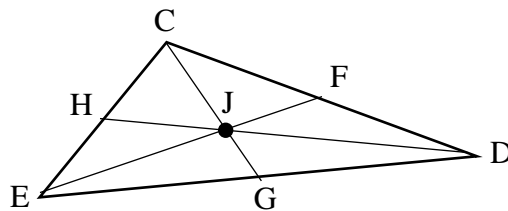
47. In the diagram of $\triangle CDE$ and its medians, $CJ = 15$, $HJ = 9.5$, $CD = 27$. Find the following lengths.

a. $JG =$ _____

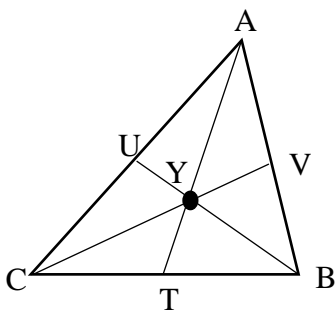
b. $HD =$ _____

c. $FD =$ _____

d. $CG =$ _____

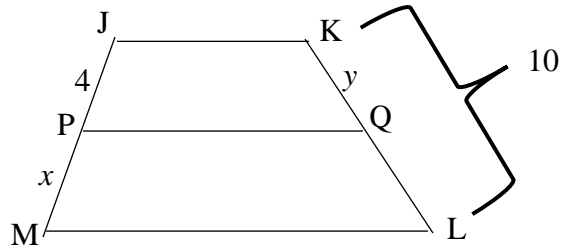


48. Point Y is the centroid of this triangle. If $YC = 2x + 10$ and $VC = 4x - 10$, find x .



49. What values of x and y would prove that \overline{PQ} is the midsegment of trapezoid JKLM?

- A. $x = 4$; $y = 5$
- B. $x = 4$; $y = 10$
- C. $x = 8$; $y = 5$
- D. $x = 8$; $y = 10$

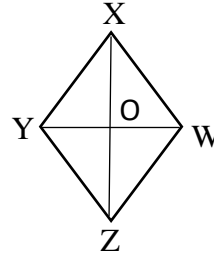


50. Write the missing reason in the proof to show that $\overline{YZ} \cong \overline{WZ}$

Given: Quadrilateral WXYZ is a rhombus

\overline{ZX} bisects $\angle YXW$

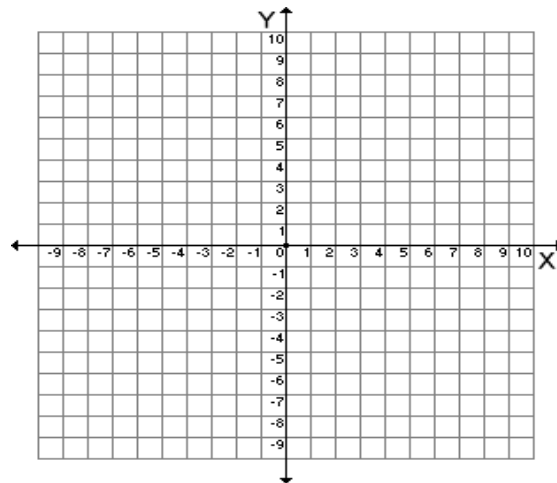
Prove: $\overline{YZ} \cong \overline{WZ}$



Statement	Reason
1. Quadrilateral WXYZ is a rhombus \overline{ZX} bisects $\angle YXW$	1. Given
2. $\overline{YX} \cong \overline{WX}$	2. In a rhombus, all sides are congruent
3. $\angle YXZ \cong \angle WXZ$	3. In a rhombus, diagonals bisect opposite angles
4. $\overline{XZ} \cong \overline{XZ}$	4.
5. $\triangle YXZ \cong \triangle WXZ$	5.
6. $\overline{YZ} \cong \overline{WZ}$	6.

51. Three vertices of a parallelogram ABCD are given.
Find the location of point D.

- a. $A(1, 5)$, $B(3, 3)$, $C(8, 3)$
- b. $A(-5, 0)$, $B(-2, -4)$, $C(3, 0)$



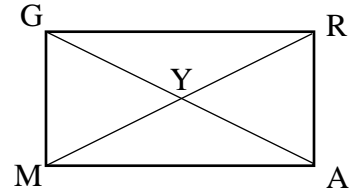
52. Which of the following sets of information is NOT enough to prove that parallelogram GRAM is a rectangle?

a. $\angle GMR \cong \angle AMR \cong \angle GRM \cong \angle ARM$

b. $GY = AY = RY = MY$

c. $\angle GRM$ and $\angle ARM$ are complementary

d. $GR^2 + RA^2 = GA^2$



53. Three vertices of a rectangle ABCD are A(3, 6), B(-2, 4), and C(0, -1), Find the location of point D. (Use the graph in #51 if needed)

54. Which of the following conditions is NOT enough to conclude that a figure is a rectangle?

- A. It is a parallelogram and diagonals bisect their angles.
- B. It is a parallelogram with a right angle.
- C. It is a rhombus with congruent diagonals.
- D. It is a parallelogram with opposite angles that are supplementary.

55. Which of the following conditions is NOT enough to conclude that a figure is a rhombus?

- A. A figure is a parallelogram with two consecutive congruent sides.
- B. A figure is a parallelogram with perpendicular diagonals.
- C. A figure is a parallelogram and one diagonal forms two congruent triangles.
- D. A figure is a parallelogram and one diagonal bisects its angles

56. Which of the following conditions is NOT sufficient to prove that a figure is a square?

- A. The figure is a rectangle with perpendicular diagonals.
- B. The figure is a parallelogram with perpendicular diagonals.
- C. The figure is a rhombus with one right angle.
- D. The figure is a rhombus with congruent diagonals.

57. Which of the following are sufficient to prove a quadrilateral is a parallelogram?

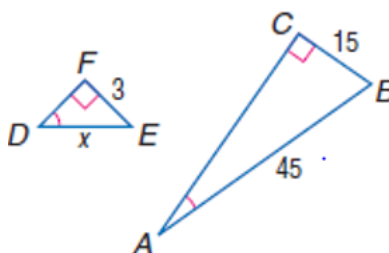
- I. Show both pairs of opposite sides parallel.
- II. Show both pairs of opposite angles are congruent.
- III. Show both pairs of opposite sides congruent.
- IV. Show one pair of opposite sides are both parallel and congruent.
- V. Show the diagonals bisect each other.

- A. I, II, III only
- B. I, II, III, and IV only
- C. I, II, III, and V only
- D. I, II, III, IV and V

UNIT 3 – ACTIVITIES 17 – 19

58. What are the ways to prove two triangles are similar?

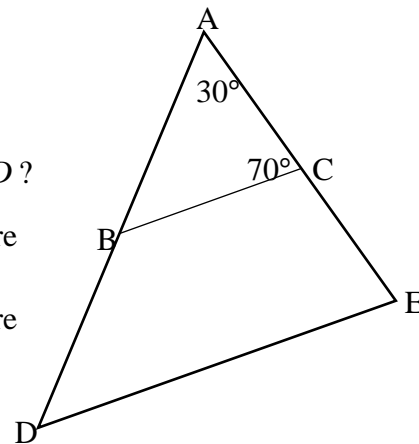
59. Given the triangles in the diagram, find DE.



60. Suppose $\angle ACB \cong \angle AED$ in the figure shown.

Based on the figure and the given statement, which can prove that $\triangle ACB \sim \triangle AED$?

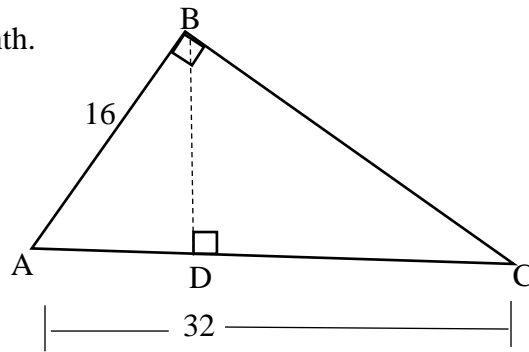
- A. $m\angle ABC = m\angle ADE = 40^\circ$, and since the three corresponding angles are congruent, $\triangle ACB \sim \triangle AED$.
- B. $m\angle ABC = m\angle ADE = 80^\circ$, and since the three corresponding angles are congruent, $\triangle ACB \sim \triangle AED$.
- C. \overline{AC} is proportional to \overline{AE} , and since two corresponding angles are congruent, $\triangle ACB \sim \triangle AED$.
- D. \overline{AB} is proportional to \overline{AD} , and since two corresponding angles are congruent, $\triangle ACB \sim \triangle AED$.



61. If a school's 48-foot flagpole casts a 64-foot shadow, approximately how long will the shadow be for a 5'6" girl who is standing near the flagpole to the nearest tenth?

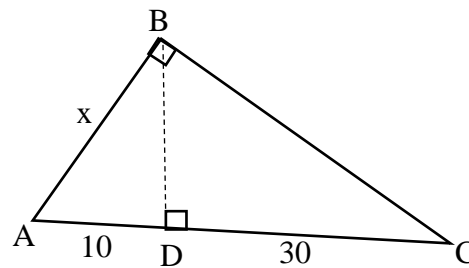
62. Determine the value of altitude BD to the nearest tenth.

- A. 8.0
- B. 13.9
- C. 22.9
- D. 24.0



63. Determine the value of x . Round to the nearest whole number, if necessary.

- A. 14
- B. 17
- C. 20
- D. 35



64. Ramon places a mirror on the ground 45 ft from the base of a flagpole. He walks backwards until he can see the top of the flagpole in the middle of the mirror. At that point, Ramon's eyes are 6 ft above the ground and he is 7.5 ft from the mirror. What is the height of the flagpole?

