

**Geometry Honors Semester 1  
Final Exam Review 2017-2018**

**Name:** \_\_\_\_\_

**Date:** \_\_\_\_\_ **Period:** \_\_\_\_\_

**Formulas:**

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

**Transformations:**

1. Translation –
2. Reflections –
3. Rotations –
  - a.  $90^\circ$  -
  - b.  $-90^\circ$  -
  - c.  $180^\circ$  -
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 3<sup>rd</sup> side, and its length is one half the length of the 3<sup>rd</sup> 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
- All 2 properties of the Rectangle
- All 3 properties of the Rhombus

#### Kite:

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

#### Kite:

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

#### Trapezoid:

- 1.
- 2.

#### Isosceles Trapezoid:

- 1.
  - 2.
  - 3.
- Plus the 2 properties of the Trapezoid

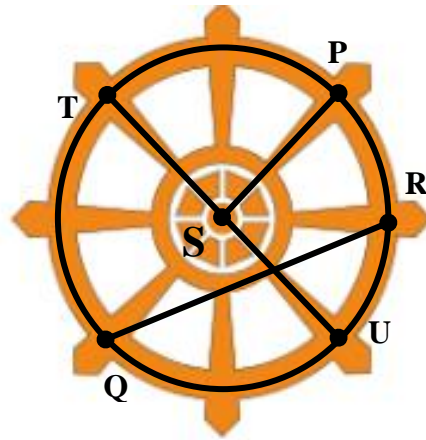
#### Ways to prove Quad. is a parallelogram

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

**UNIT 1 – ACTIVITIES – 1 – 8**

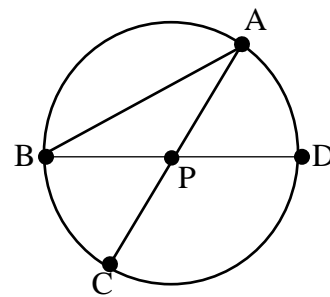
1. Use circle S to identify the following.

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



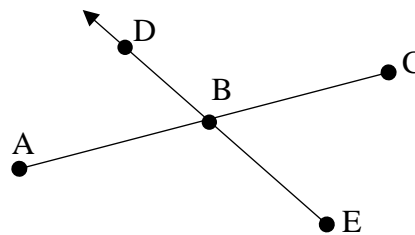
2. Use circle P at the right.

- 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?

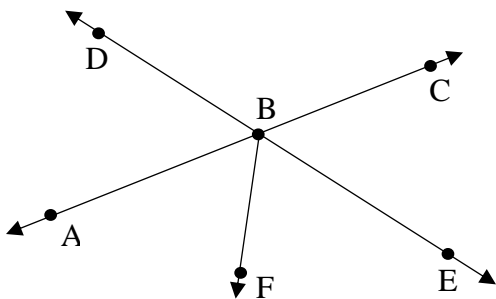


3. Which describes the geometric figures in the diagram?

- 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.  $\overrightarrow{DE}$  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  $180^\circ$ .

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  $180^\circ$ .
- 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  $180^\circ$ .
- E. Given  $\angle 1$  and  $\angle 2$  have a sum less than  $180^\circ$ ; therefore, they are both acute angles.
- F. Given  $\angle 1$  and  $\angle 2$  have a sum less than  $180^\circ$ ; therefore, they are complementary.

6. Consider the conditional statement:

**Conditional:** If a student plays the trumpet, then the student is in the school band.

Which is a counterexample to this conditional statement?

- A. A student can be in the band but not play the trumpet.
- B. A student may not be in the band and not play the trumpet.
- C. A student can play the trumpet but not be in the school band.
- D. A student may not play the trumpet but still be in the school band.

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

**Conditional:** If the sun is out, then we will go to the beach.

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

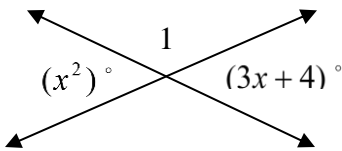
9. Suppose point  $D$  is in the interior of  $\angle ABC$ ,  $m\angle ABC = 12x - 110$ ,  $m\angle ABD = 3x + 40$ , and  $m\angle DBC = 2x - 10$ . What is  $m\angle ABC$ ?

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. A map of a small town identifies the town square as the origin  $(0,0)$ . Each block along a street is represented by one unit along the  $x$ - or  $y$ - axis. The ice cream shop  $(5,4)$  and the grocery is at  $(-3,2)$ . The grocer wants to install an overhead delivery cable directly between the grocery store and the ice cream shop to expedite deliveries. What is the length of this cable to the nearest tenth of a block?

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  $m\angle 1$ .

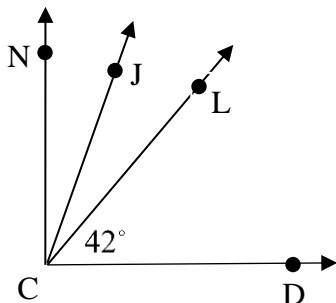


14. Use the diagram shown.



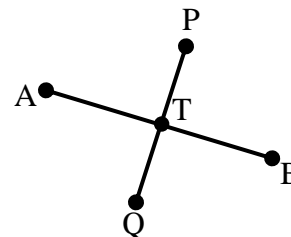
What is the justification for the statement that  $PQ + QR = PR$ ?

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

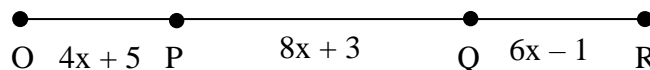


16. In the diagram shown,  $AB \perp PQ$ . If  $PT = TQ$ , which statement is true?

- 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  $\overline{AB}$

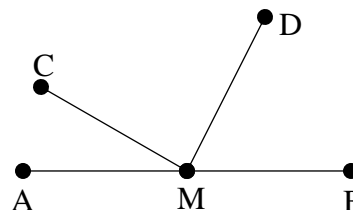


17. In the diagram,  $\overline{OP} \cong \overline{QR}$ . Find the length of  $\overline{PR}$ .



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

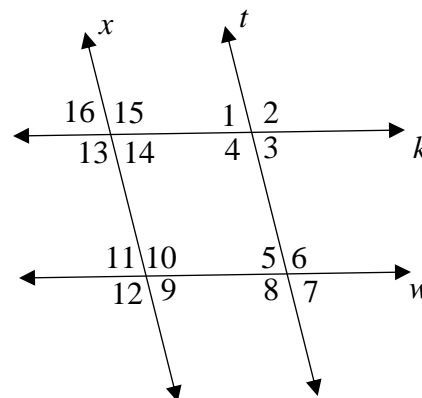
Allison states  $\angle AMC + \angle CMD + \angle DMB = \angle AMB$ .  
State the postulate that justifies this statement.



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.**

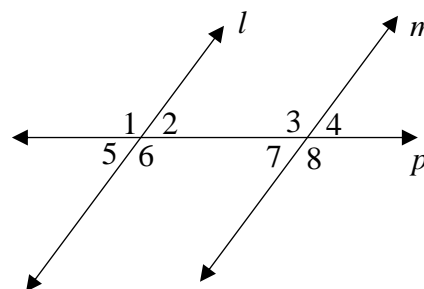
- A.  $\angle 2 \cong \angle 4$
- B.  $\angle 2 \cong \angle 6$
- C.  $\angle 2 \cong \angle 8$
- D.  $\angle 2 \cong \angle 10$
- E.  $\angle 2 \cong \angle 12$
- F.  $\angle 2 \cong \angle 15$



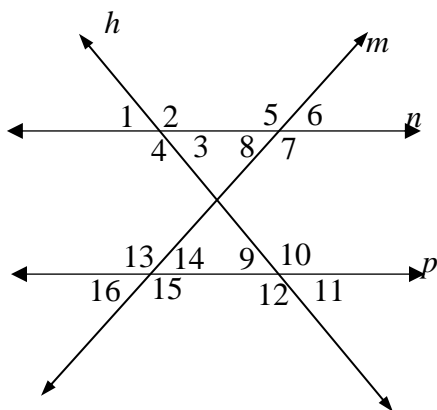
20. In the diagram shown, lines  $l$  and  $m$  are parallel.

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  $\angle 4$



For problems 21 – 25, refer to the figure below to answer the question. You are given  $n \parallel p$ .



21. What is the relationship between  $\angle 2$  and  $\angle 12$ ? What type of angles AND mathematical relationship.
22. What is the relationship between  $\angle 3$  and  $\angle 11$ ? What type of angles AND mathematical relationship.
23. What is the relationship between  $\angle 14$  and  $\angle 16$ ? What type of angles AND mathematical relationship.
24. What is the relationship between  $\angle 3$  and  $\angle 9$ ? What type of angles AND mathematical relationship.
25. What is the relationship between  $\angle 3$  and  $\angle 10$ ? What type of angles AND mathematical relationship.
26. Write the equation in slope-intercept form of the line that passes through  $(6, -2)$  and is parallel to the line  $2x + y = 3$ .
27. Write the equation in slope-intercept form of the line that passes through  $(-2, -3)$  and is perpendicular to the line  $x + y = 2$ .

**UNIT 2 – ACTIVITIES 9 – 16**

28. 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?

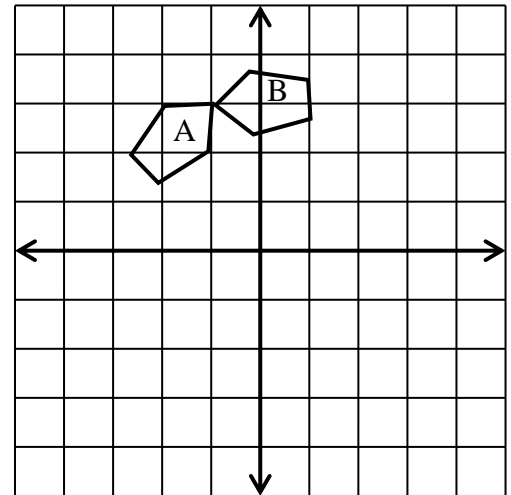
29. Suppose  $\triangle ABC \cong \triangle LMN$ , and the side lengths of  $\triangle ABC$  are shown in the table below.

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

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

30. Pentagon A and its rotated image B are shown on the grid.

- What is the center of rotation?
- What is the magnitude of the rotation?
- What is the direction of the rotation?
- Using proper notation, write the rotation.



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

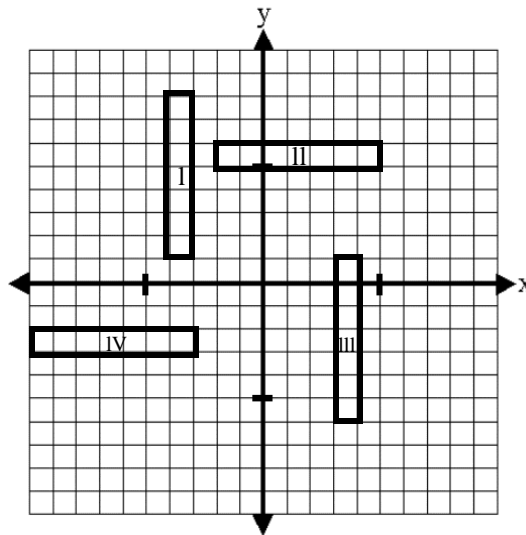
- a reflection across the line  $x = 3$
- a reflection across the line  $x = 7$
- a reflection across the line  $x = 10$
- a reflection across the line  $y = 3$

32. A regular polygon has a rotational symmetry with an angle of  $36^\circ$ . Identify the polygon it's referring to.



33. 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



34. 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.

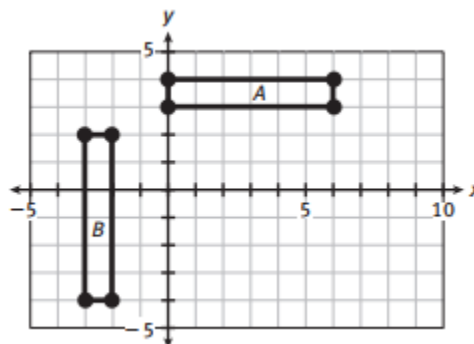
Point	Preimage	Original translation Image	Additional translation image
A	(2,-1)	(1,2)	
B	(2, -3)	(1, 0)	
C	(6,-1)	(5, 2)	
D	(6,-3)	(5, 0)	

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

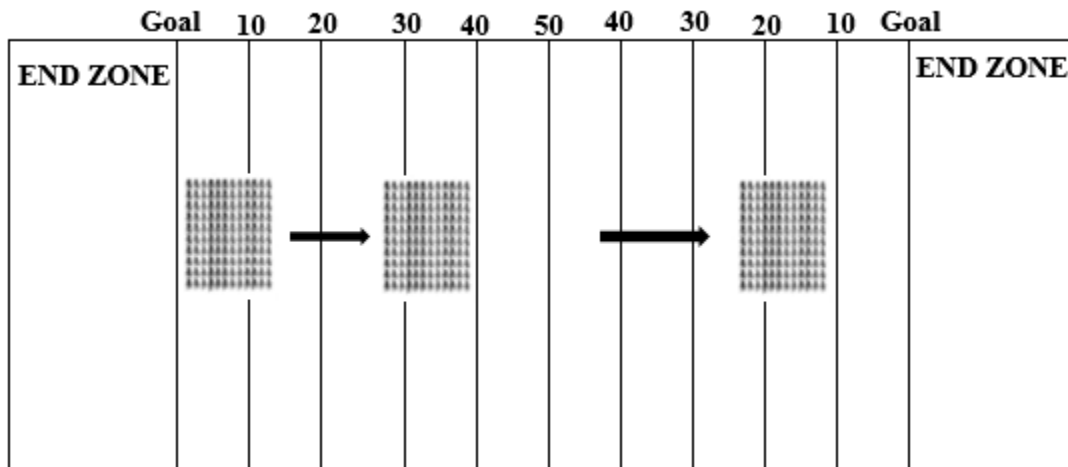
Point	Preimage	Original translation Image
A	(2,-1)	(9, -12)
B	(2, -3)	(9, -14)
C	(6,-1)	(13, -12)
D	(6,-3)	(13, -14)

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

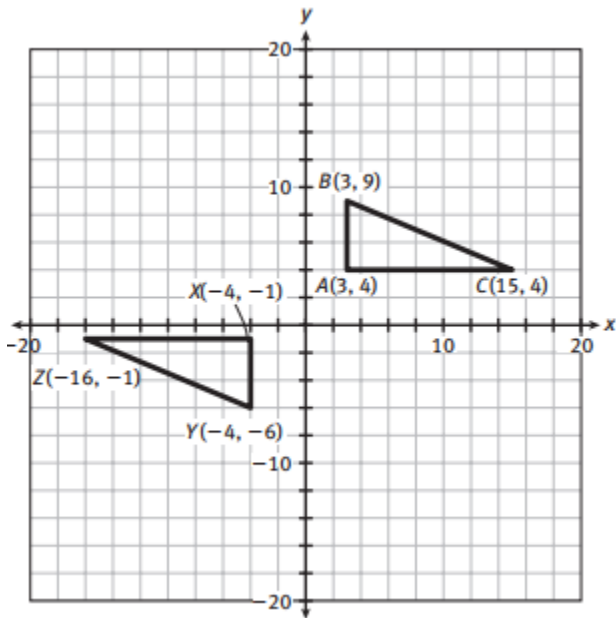
- A.  $R_{(0, 3), 90^\circ}$  ( $T_{(-3, 0)}$  (A))
- B.  $T_{(-2, -7)}$ , ( $R_{(0, 3), 90^\circ}$  (A))
- C.  $T_{(-2, -7)}$ , ( $R_{(0, 3), 90^\circ}$  (B))
- D.  $T_{(-2, -7)}$ , ( $R_{(0, 3), -90^\circ}$  (A))



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

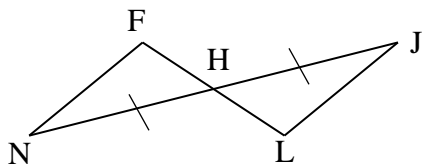


38. Explain why  $\triangle ABC$  and  $\triangle XYZ$  are right triangles.

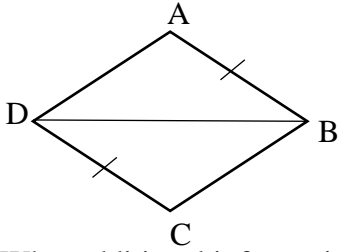


39. Suppose  $\triangle QRS \cong \triangle TUV$  are congruent right triangles such that  $\angle R$  is a right angle and  $\angle V = 35^\circ$ . What is the measure of  $\angle Q$ ?

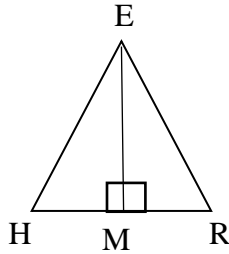
40. What additional information need to be given to develop the proof that  $\triangle FHN \cong \triangle LHJ$  by ASA congruence criteria?



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



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



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

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

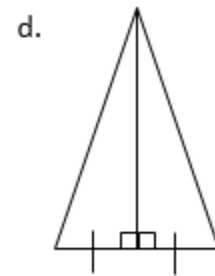
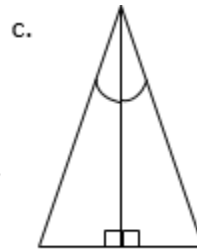
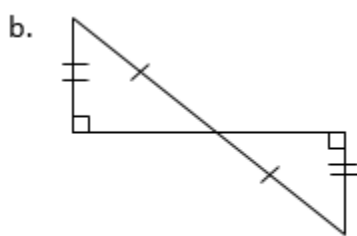
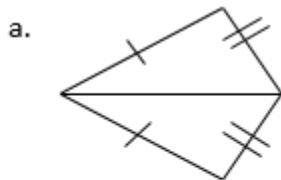
$\overline{AB} \parallel \overline{EF}$

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

$\angle BCA \cong \angle FGE$

$\angle CBA \cong \angle GEF$

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

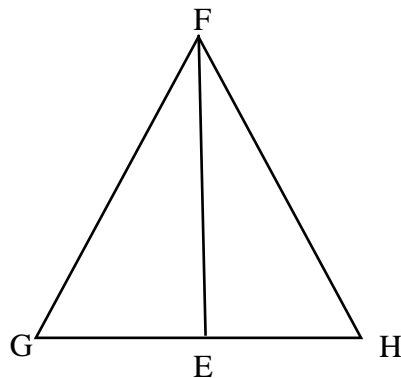


45. When do you use CPCTC?

46. 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  $GH$

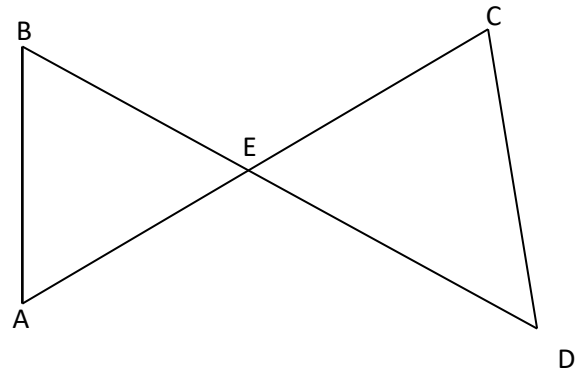


47. Rewrite #46 as a flowchart proof:

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

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

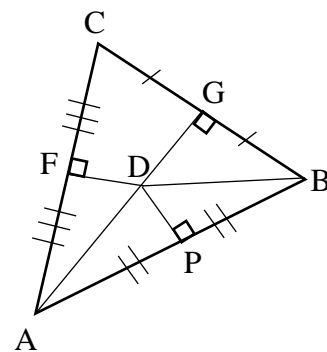
**Prove:**  $\triangle AEB \cong \triangle CED$



49. Given  $\triangle ABC$ :

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

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



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

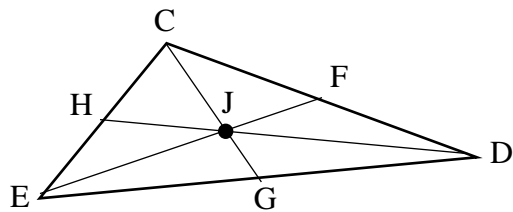
$$y = x + 1 \quad \text{and} \quad y = -2x - 1$$

What are the coordinates of the orthocenter of the triangle?

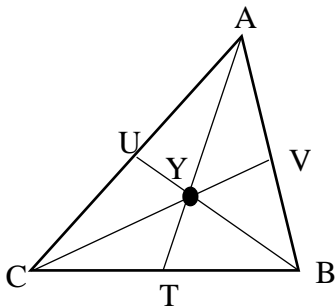
- A. (0, 1)
- B. (2, 3)
- C.  $\left(-\frac{2}{3}, \frac{1}{3}\right)$
- D.  $\left(-\frac{2}{3}, -\frac{1}{3}\right)$

51. In the diagram of  $\triangle CDE$  and its medians,  $CJ = 3$ ,  $HJ = 4.5$ ,  $CD = 12$ . Find the following lengths.

- a.  $JG =$  \_\_\_\_\_
- b.  $HD =$  \_\_\_\_\_
- c.  $FD =$  \_\_\_\_\_
- d.  $CG =$  \_\_\_\_\_

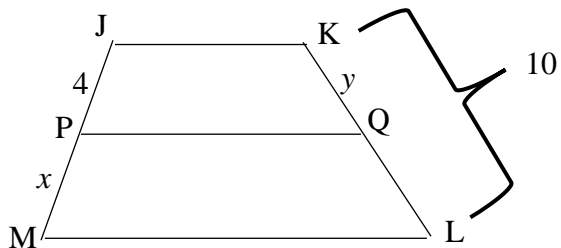


52. Point  $Y$  is the centroid of this triangle. If  $YC = 6.5$ . Find the length of  $VC$ .



53. 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.  $x = 8$ ;  $y = 10$

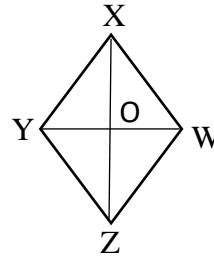


54. Write the missing reason in the proof to show that  $\overline{YZ} \cong \overline{WZ}$

**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.

55. 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 )

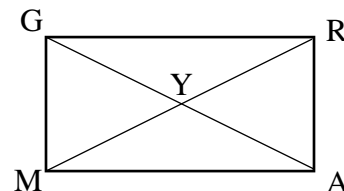
56. Which of the following sets of information is NOT enough to prove that parallelogram GRAM is a rectangle?

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



57. Three vertices of a rectangle ABCD are  $A(3, 6)$ ,  $B(-2, 4)$ , and  $C(0, -1)$ , Find the location of point D.
58. 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.
59. 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.
60. 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.
61. 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

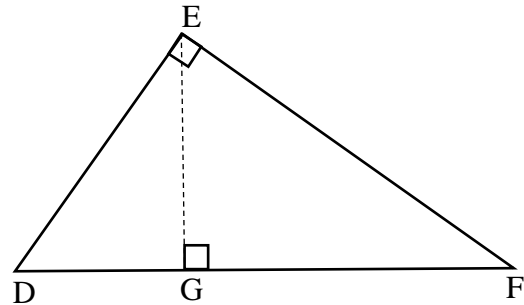


UNIT 3 – ACTIVITIES 17 – 19

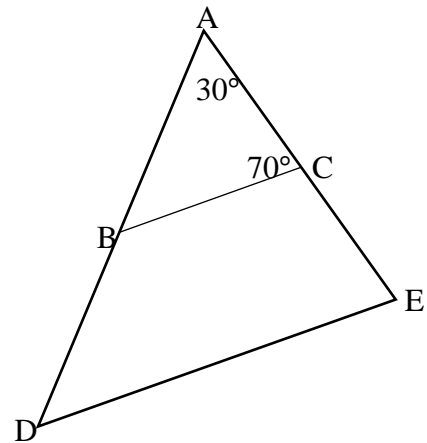
62. What are the ways to prove two triangles are similar?

63. Determine the similarity statement for the three triangles in the diagram.

- A.  $\triangle DEF \sim \triangle DGE \sim \triangle EFG$
- B.  $\triangle DEF \sim \triangle EGD \sim \triangle FGE$
- C.  $\triangle DEF \sim \triangle DGE \sim \triangle EGF$
- D.  $\triangle DEF \sim \triangle EDG \sim \triangle EGF$



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



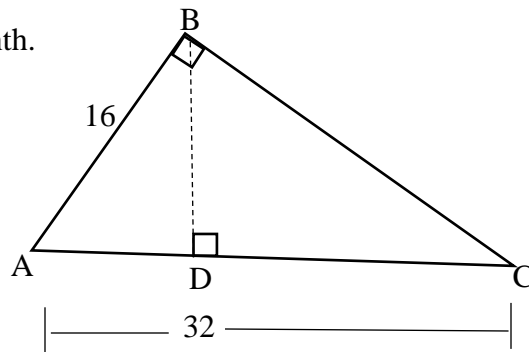
Based on the figure and the given statement, which can prove that  $\triangle ACB \sim \triangle AED$ ?

- A.  $m\angle ABC = m\angle ADE = 40^\circ$ , and since there are two pairs of corresponding angles congruent,  $\triangle ACB \sim \triangle AED$ .
- B.  $m\angle ABC = m\angle ADE = 80^\circ$ , and since there are two pairs of corresponding angles 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,  $\triangle ACB \sim \triangle AED$ .

65. 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?

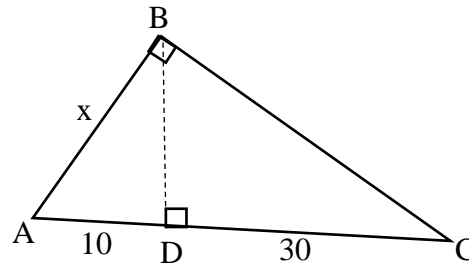
66. Determine the value of altitude  $BD$  to the nearest tenth.

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



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

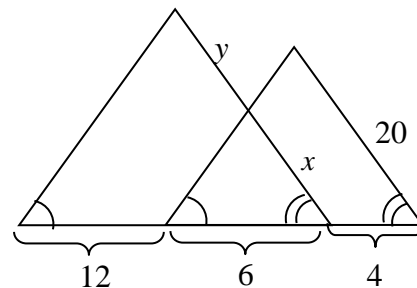
- A. 14
- B. 17
- C. 20
- D. 35



For questions 68 and 69 use the diagram below.

68. Find  $x$

69. Find  $y$



70. Mike is trying to figure out how high the top of his house is. In line with his eye sight to the top of his house is a tree that is 26 feet tall. Mike's eyes are 5 feet off the ground, and he knows he is 14 feet away from the tree. If Mike is 30 feet away from his house, how tall is his house?

