Geometry
Curriculum Sample

A Grade Ahead's rigorous, year-round math enrichment program is designed to challenge your child to a higher academic standard. Our monthly curriculum includes mathematical concepts that your child will see in school. Your child will learn and apply math concepts to real-world situations through word problems and develop strong critical thinking and analytical skills.

Each week will have an in-depth lesson (which we call Examples), homework, and answers. In these next pages, we offer a closer look at what our Examples, homework, and answers offer as well as a specific example of each.

Examples

To illustrate the topic, examples are provided to you and your child. These examples help demonstrate how to solve the problem or figure out the answer.

Examples - Geometry [Grades 9-10]

Example: $m\overline{AB} = m\overline{CD}$, and $m\overline{DE} = 2$. If $m\overline{AB} + 6 = 8$, then, what how does $m\overline{CD}$ relate to $m\overline{DE}$?
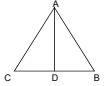
$m\overline{AB} + 6 = 8$	
$m\overline{CD} + 6 = 8$	Substitution PTY
$m\overline{CD} = 2$	Subtraction PTY
$m\overline{DE} = 2$	
$m\overline{CD} = m\overline{DE}$	Transitive PTY

The Reflexive Property

$a = a$

The reflexive property allows us to state that something is equal to itself. This property is most commonly used when 2 objects share a side, or a side needs to be referenced at a later point.

Example: How can you prove that ΔABD and ΔACD have at least one congruent side?

Since ΔABD and ΔACD both share side AD and we are able to state that AD ≅ AD since anything is congruent to itself. Therefore, by the reflexive property, ΔABD and ΔACD have at least one congruent side.

Symmetric Property

that two items are equal to each other ev...
flip an equation to put...

Lesson pages are titled "Examples – Geometry [Grades 9–10]," answer pages are titled "Answers – Geometry [Grades 9–10]," and homework pages are simply titled "Geometry [Grades 9–10]."

Homework

Each week, four days of homework are given to apply concepts from that week's lesson and reinforce the topic.

Answers

Answers are provided to check your child's homework. Enter the scores into the Parent Portal to track progress and note which areas may need more work.

Geometry Terms, Algebraic Properties, and Addition Postulates

Teaching Tip: *Students should be familiar with lines, planes, and angles. Sections A and B (with the exception of constructions) can be reviewed quickly to allow for more focus on Sections C and D. Algebraic Properties can be easily referred back to during homework.*

Student Goals:

✓ I will be able to identify and explain examples of key geometric terms.

✓ I will be able to identify midpoints and bisectors.

✓ I will be able to construct segment bisectors and duplicate segments.

✓ I will be able to find missing values using the addition postulates.

✓ I will be able to identify the properties.

A. Geometry Introduction and Term Review

Geometry helps us understand the math behind what surrounds us. We use geometry to discover more about and make comparisons between two- and three-dimensional shapes, planes, lines, and points, and we use that information to make even more discoveries.

In geometry, students will study facts that have already been proven true as well as the methods used to prove them. This process relies heavily on definitions, interpreting figures, and eliminating assumptions. One of the main rules of geometry is not to assume.
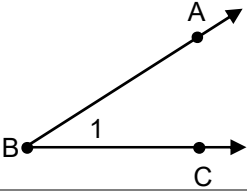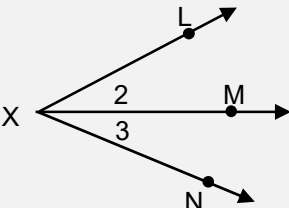
Congruence

When comparing two or more objects in geometry, we use the term **congruent** to describe objects that have the same size and shape but are still separate objects from each other. We use the symbol $\cong$ to indicate that objects are congruent. Tick marks indicate congruent sides, and curves mark congruent angles:
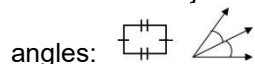
Review Terms　　| Day 1 Q1-8 |

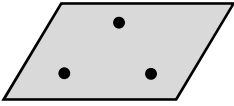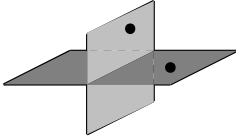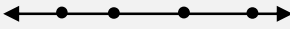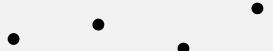| Term	Definition	Example Image	Name(s)
Point	A place in space that can be described by location with no length or width	• A	Capital Letter Ex. Point A
Line	A straight path made of infinite points with no endpoints: It goes forever in both directions.		Line x Line AB $\overleftrightarrow{AB}$
Line Segment	A part of a line consisting of two endpoints and all of the points between them		Line segment AD $\overline{AD}$
Ray	A part of a line with one endpoint and extending indefinitely in the other direction		Name by endpoint first. Ray BD $\overrightarrow{BD}$
Plane	A flat surface that extends in two directions indefinitely with no height or thickness		Plane ABCD Plane P
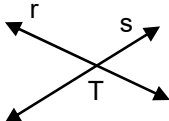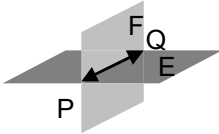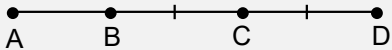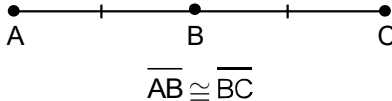
Term	Definition	Example Image	Name(s)
Angle	Two rays with the same endpoint (vertex): Each ray is called a side.		1 angle: $\angle 1$, $\angle B$, or $\angle ABC$
Adjacent Angles	Two angles that share a vertex and have a common side		3 different angles: $\angle X$ or $\angle LXN$ $\angle 2$ or $\angle LXM$ $\angle 3$ or $\angle MXN$

B. Lines and Planes

Euclidean Space | *Day 1 Q1-8* |

Euclidean Space is the set of all points in three dimensions (x, y, z) or the points that we can see. All topics in this class will be based on this concept of Euclidean Geometry unless otherwise stated.

Term	Definition	Example Images
Coplanar Points	Points that lie in the same plane	 Coplanar points Non-coplanar points
Collinear Points	Points that lie in the same line (collinear points are also coplanar.)	 Collinear points Non-collinear points
Intersection	When a line or plane meets, cuts across, or overlaps another line or plane	 Line r and line s intersect at T. Plane E and plane F intersect at $\overleftrightarrow{PQ}$.
Congruent Segments	Line segments that are equal in length ($\overline{BC} \cong \overline{CD}$). Tick marks are used to show congruence in a figure.	 Line Segment BC $\cong$ Line Segment CD
Midpoint of a Segment	Divides a segment into two congruent segments	 $\overline{AB} \cong \overline{BC}$

Duplicating a Line Segment | Day 1 Q37 |

1. If a line segment is not provided, draw one using the straight edge.
2. Draw a second, longer line segment using the straight edge.
3. Next, place the metal or plastic point of the compass on one end of the line segment (the point should be the part that does not have a pencil).
4. Adjust the opening of the compass so that it is equal to the length of the line segment.
5. Without changing the spacing of the compass, place the metal or plastic point of the compass on the left end of the second line segment and draw a small curve across the line.
6. Make a point where the curve crosses the line. The distance from the end point to the created point is the duplicate of the original line segment.
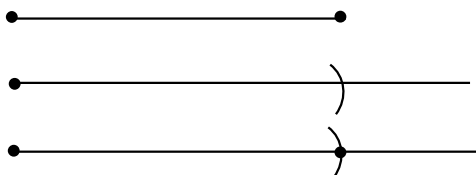
> **Teaching Tip:** _This construction and the one to follow can both be demonstrated on the board for students to see while students construct their own. Make sure they follow you at each step, to help them remember._
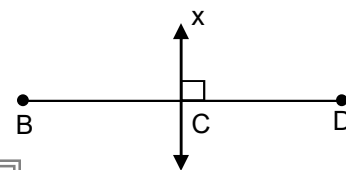
C. Bisectors

A bisector is a line, segment, ray, or plane that cuts another figure into two equal parts. The two most common types of bisectors are segment bisectors and angle bisectors (they are named for the figure that they bisect).

| Segment Bisector	Angle Bisector
A segment bisector crosses through the midpoint of a segment, splitting that segment into two equal parts. In this example, line x is a bisector of $\overline{BD}$; therefore, $\overline{BC} \cong \overline{CD}$.	An angle bisector passes through the vertex of an angle and divides that angle into two congruent smaller angles. In this example, ray BD is a bisector of $\angle ABC$; therefore $\angle 1 \cong \angle 2$.

Perpendicular Bisector

A **perpendicular bisector** is a segment bisector that passes through the midpoint of a segment at a right angle (90°). In the figure to the right, line x is a perpendicular bisector of $\overline{BD}$; therefore, $\overline{BC} \cong \overline{CD}$.

| Day 1 Q38 |

Constructing a Perpendicular Bisector for a Line Segment

1. If a line segment is not provided, draw one using the straight edge.
2. Next, place the metal or plastic point of the compass on one end of the line segment (the point should be the part that does not have a pencil).
3. Adjust the opening of the compass so that it is more than half of the line segment.
4. Rotate the compass to draw a small curve above and below the line segment.
5. Without changing the spacing of the compass, move it so that the point is resting on the opposite end of the line segment.
6. Rotate the compass to draw a small curve above and below the line segment (these curves should cross the curves drawn in step 4).
7. Connect the points where the curves cross using the straight edge.
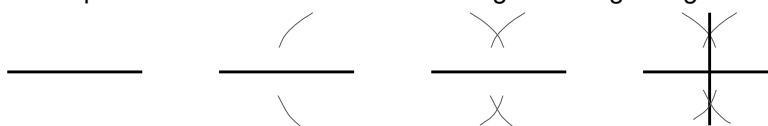
D. Postulates & Properties

Postulates and properties have two purposes: they work as explanations to help learn the concepts, and they also work as justifications to help prove new concepts.

Students will be able to recognize new justifications by the dark box that they are written in (such as the box the "Segment Addition POST" is defined in below).

Postulates | Day 1 Q35 & 36 |

Postulates, also known as axioms, are statements that are accepted as true without needing proof. The abbreviation for a postulate is POST.

Teaching Tip: _The Segment and Angle Addition Postulates can both be remembered by thinking about them as the parts added to make a whole and emphasizing that the name of each postulate summarizes its purpose._

Segment Addition POST

If B is a point on the line segment $\overline{AC}$, then $m\overline{AB} + m\overline{BC} = m\overline{AC}$.

A   B   C
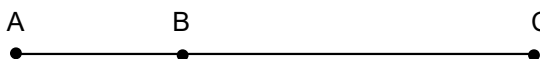
Example: For the line segment given below, write two equations that equal $m\overline{AD}$ using the Segment Addition Postulate.

A   B   C   D
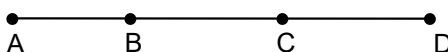
$m\overline{AB} + m\overline{BD} = m\overline{AD}$

$m\overline{AC} + m\overline{CD} = m\overline{AD}$

Note: Using **m** _before an angle or segment indicates measure:_

$m\overline{AB}$ = measure of $\overline{AB}$
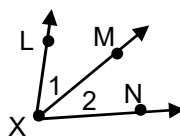
$m\angle ABC$ = _measure of_ $\angle ABC$

Use m when writing an equation with an equal sign, not a congruence sign:

$m\overline{AB} = 7$

$\overline{AB} \cong 7$ _(Note that some teachers may not accept congruence sign with a number, but in HS, it is accepted.)_

Angle Addition POST

If ray $\overrightarrow{XM}$ lies in the interior of $\angle LXN$, then $m\angle LXM + m\angle MXN = m\angle LXN$

Example: Solve for $m\angle 1$ and $m\angle 2$ given that the following is true:
$m\angle ABC = x + 45°$; $m\angle 1 = x + 5$; $m\angle 2 = x - 2$
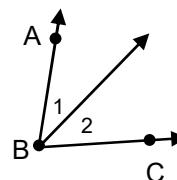
$m\angle ABC = m\angle 1 + m\angle 2$ Angle Addition Postulate
$x + 45 = x + 5 + x - 2$
$x + 45 = 2x + 3$
$x = 42$

$m\angle 1 = 42 + 5 = 47°$
$m\angle 2 = 42 - 2 = 40°$

Properties of Equality | Day 1 Q16-26 |

Review Properties	Definition	Example
Addition Property	If a = b, then, a + c = b + c.	Solve for x: x − 3 = 15 x − 3 + 3 = 15 + 3 Addition PTY x = 18
Subtraction Property	If a = b, then, a − c = b − c.	Solve for m∠A: m∠A + m∠B = 98˚ m∠A + m∠B − m∠B = 98˚ − ∠B Subtraction PTY m∠A = 98˚ − m∠B
Multiplication Property	If a = b, then, ac = bc.	Solve for x: $\frac{x}{5} = 2$ $5 \times \frac{x}{5} = 2 \times 5$ Multiplication PTY x = 10
Division Property	If a = b and c ≠ 0, then, $\frac{a}{c} = \frac{b}{c}$.	Solve for a: $a \times 12 = 48$ $a \times 12 \div 12 = 48 \div 12$ Division PTY a = 4
Distributive Property	a(b + c) = ab + ac.	3(x + 2) = 3x + 6 (3)(x) + (3)(2) = 3x + 6 Distributive PTY 3x + 6 = 3x + 6

The Substitution Property

If a = x, and a + b = c, then, x + b = c.

The substitution property is similar to those of Addition, Subtraction, Multiplication, and Division, except it allows us to replace part of an original statement with an equivalent term and the statement will stay true.

Example: m$\overline{AB}$ = m$\overline{CD}$. If m$\overline{AB}$ + 6 = 8, then, what is m$\overline{CD}$?

Note: The abbreviation for a property is PTY.

m$\overline{AB}$ + 6 = 8
m$\overline{CD}$ + 6 = 8   Substitution PTY
m$\overline{CD}$ = 2   Subtraction PTY

The Transitive Property

If a = b, and b = c, then a = c.

The transitive property allows us to take a previously discovered fact and incorporate it to make a later connection. It is _always at least a 3-step process._

Example: m $\overline{AB}$ = m $\overline{CD}$, and m $\overline{DE}$ = 2. If m $\overline{AB}$ + 6 = 8,then, what how does m $\overline{CD}$ relate to m $\overline{DE}$?

m $\overline{AB}$ + 6 = 8
m $\overline{CD}$ + 6 = 8   Substitution PTY
m $\overline{CD}$ = 2   Subtraction PTY
m $\overline{DE}$ = 2
m $\overline{CD}$ = m $\overline{DE}$ Transitive PTY

The Reflexive Property

a = a

The reflexive property allows us to state that something is equal to itself. This property is most commonly used when 2 objects share a side, or a side needs to be referenced at a later point.

Example: How can you prove that ∆ABD and ∆ACD have at least one congruent side?
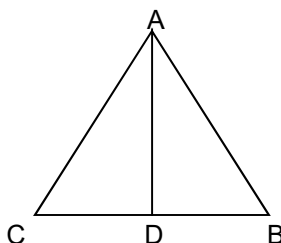
Since ∆ABD and ∆ACD both share side AD and we are able to state that AD ≅ AD since anything is congruent to itself. Therefore, by the reflexive property, ∆ABD and ∆ACD have at least one congruent side.

The Symmetric Property

If a = b, then b = a.

The symmetric property tells us that two items are equal to each other even when given in the opposite order. This is the property that allows us to flip an equation to put the variable on the left.

Example: Solve 2x + 5 = 3x − 4 for x.

2x + 5 = 3x − 4
5 = x − 4   Subtraction Property
9 = x   Addition Property
x = 9   Symmetric Property

Note: Of these four new properties, the Substitution Property and Transitive Property will be most commonly used in high school geometry. It is important for students to learn the difference between the two in order to tell which is being applied in problems.
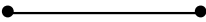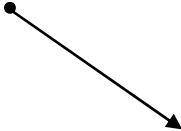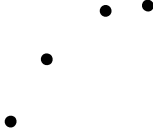

Date: _____   Start Time: _____   End Time: _____
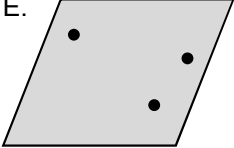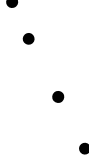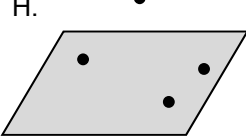   Score:_____/40

**You may use a calculator unless otherwise indicated. Figures are not drawn to scale.**

Match the image with the correct term.

A.	B.	C.	D.
E.	F.	G.	H.

1. Collinear Points   _____   2. Line Segment   _____

3. Non-coplanar Points   _____   4. Point   _____

5. Ray   _____   6. Non-collinear Points _____

7. Line   _____   8. Coplanar Points   _____

Use your knowledge of lines and planes to answer the following questions.

9. How many points are necessary to determine a line?   _____

10. How many points are needed to be non-collinear?   _____

11. How many points are necessary to determine a plane?   _____
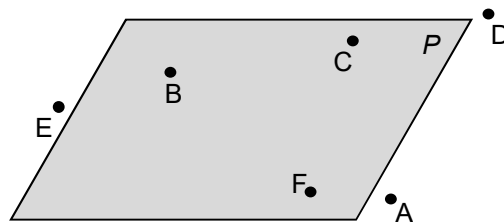
12. What is the name of the plane above?   _____

13. List the points that are coplanar.   _____

14. List the points that are non-coplanar with the given plane. _____

15. Name an example of a plane from the room you are in.   _____

On each blank below, use your knowledge of the algebraic properties of equality to rewrite the underlined portion of each statement so that it is true for the property given.

16. By the **symmetric property**, we know that if a = 7, then <u>9 = a</u>.

_____

17. By the **transitive property**, we know that if Line A is congruent to Line B, and Line B is congruent to Line C, then <u>Line A is not congruent to Line C</u>.

_____

18. By the **substitution property**, we know that if a = x, and a + 9 = 21, then <u>x + 21 = 9</u>.

_____

19. By the **distributive property**, we know that if 6(x − 5) = 26, then <u>6x − 5 = 26</u>.

_____

20. By the **reflexive property**, we know that if Triangle ABC and Triangle DBC share side $\overline{BC}$, then $\overline{BC} \cong \overline{AC}$.

_____

Solve for b. Then, indicate which property the original equation is defining and which property is being used to solve.

21-23.   19 − 16 = b − 16

b = _____

Defining: _____

Solved by: _____

24-26.   5(3) = 5b

b = _____

Defining: _____

Solved by: _____

27-29.   b + 34 = 27 + 34

b = _____

Defining: _____
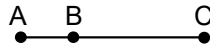
Solved by: _____

30-32. $\dfrac{7}{11} = \dfrac{b}{11}$
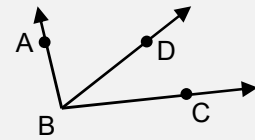
b = _____

Defining: _____

Solved by: _____

Solve the following using the Segment Addition POST or the Angle Addition POST.

33. Given m $\overline{AC}$ = 13 and m $\overline{BC}$ = 8; what is m $\overline{AB}$?
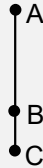
m $\overline{AB}$ = _____

34. Given m∠ABD = 43°, and m∠CBD = 38°, what is m∠ABC ?

m∠ABC = _____

35. Given m $\overline{AC}$ = 18 and m $\overline{AB}$ = $\frac{2}{3}\overline{AC}$, what is m $\overline{BC}$?

m $\overline{BC}$ = _____

36. Given m∠DEG = 2x + 5°, m∠FEG = x − 3° and m∠DEF = 122°; what is m∠FEG?
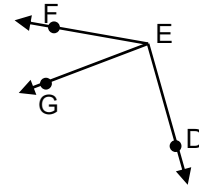
m∠FEG? = _____

Complete each construction as directed.

37. Duplicate the segment below

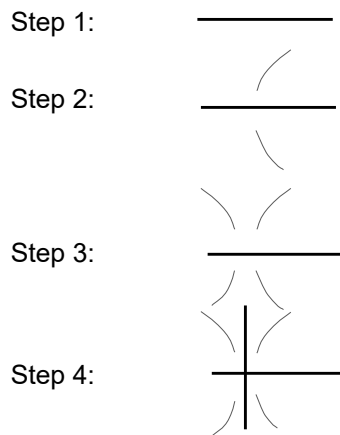38. Construct a Perpendicular Bisector for the segment below.

Circle the step in which this student made an error in duplicating a line segment and constructing a perpendicular bisector. Then, draw what the correct step should have been beneath the images.

39. Duplicating a Line Segment

Step 1:

Step 2:

Step 3:

40. Constructing a Perpendicular Bisector

Step 1:

Step 2:

Step 3:

Step 4:

You may use a calculator unless otherwise indicated. Figures are not drawn to scale.

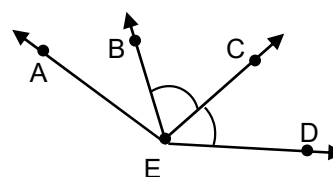**Solve for the following using the segment and angle addition postulates.**
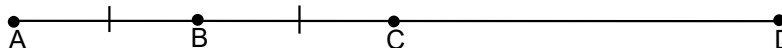
Let m $\overline{BD}$ = 24, and m $\overline{AC}$ = m $\overline{CD}$. Solve for each of the following.

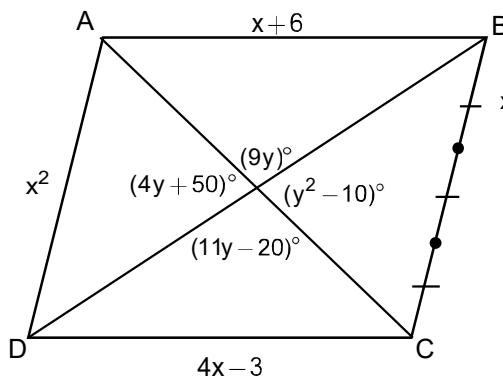1. m $\overline{BC}$ = _____   2. m $\overline{AB}$ = _____   3. m $\overline{CD}$ = _____

Let m $\angle$ AED = 96 + x, m $\angle$ BED = 3x, and m $\angle$ CED = 48°. Solve for each of the following.

4. m $\angle$ BEC = _____

5. m $\angle$ BED = _____

6. m $\angle$ AED = _____

7. m $\angle$ AEB = _____

8. m $\angle$ AEC = _____

Fill in the blank with the postulate that tells you that the equation given is true. If neither postulate you have learned works, write "none". Use the rhombus given.

9. _____ $9y + y^2 - 10 = 180°$

10. _____ $9y = 11y - 20$

11. _____ $\overline{x} + \overline{x} + \overline{x} \cong \overline{BC}$

12. _____ $x + 6 = 4x - 3$

13. _____ $9y + 4y + 50 = 180°$

Draw and label each of the following on the plane provided.

14. Draw a coplanar line segment containing three points labeled A, B, and C.

15. Draw three collinear points labeled D, E, and F that are non-coplanar with the plane given.

16. Draw three non-collinear, coplanar points labeled G, H, and I.

17. Draw three non-collinear, non-coplanar points labeled J, K, and L.

Use the information given to write an equation for x where <u>B</u> is a segment bisector. Then, write the name of the property needed to solve for x. *[Hint: You do not have to solve for x.]*
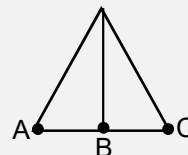
$m\,\overline{AB} = 7x$; $m\,\overline{BC} = 42$
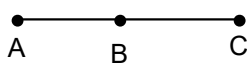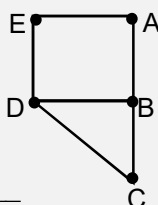

18. _____

19. _____

$m\,\overline{AB} = 52$; $m\,\overline{BC} = x - 33$
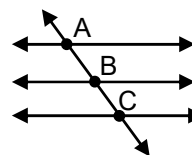

20. _____

21. _____

$m\,\overline{AB} = \dfrac{x}{9}$; $m\,\overline{BC} = 13$

22. _____

23. _____

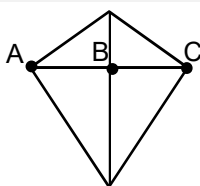$m\,\overline{AB} = 27$; $m\,\overline{BC} = x + 18$

24. _____

25. _____

$m\,\overline{AB} = 6(x - 8)$; $m\,\overline{BC} = 9$
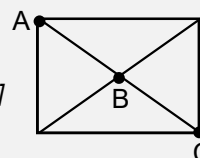*[Hint: Give only the property needed for the first step to solve.]*

26. _____

27. _____

$m\,\overline{AB} = \dfrac{24}{x}$; $m\,\overline{BC} = 8$
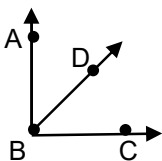*[Hint: Give only the property needed for the first step to solve.]*

28. _____

29. _____

Given that $\overrightarrow{BD}$ is a bisector, which definition or postulate makes the equation true? Circle the best answer.
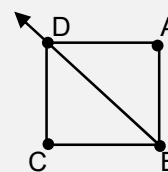
30. If $m\angle ABD = 26 + x$, and $m\angle ABC = 90°$, $26 + x + 26 + x = 90°$.

   a) Angle Addition Postulate
   b) Definition of Bisector
   c) Both a and b
   d) None of the above
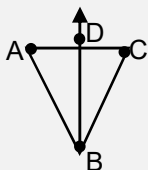
31. If $m\angle ABD = 3x$, and $m\angle DBC = x + 15$, $3x = x + 15$.

   a) Angle Addition Postulate
   b) Definition of Bisector
   c) Both a and b
   d) None of the above
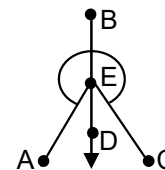
32. If $\triangle ABD \cong \triangle CBD$, $\angle ABD \cong \angle CBD$.

   a) Angle Addition Postulate
   b) Definition of Bisector
   c) Both a and b
   d) None of the above

33. If $m\angle AED = x^2 - 57$, and $m\angle AEB = 8x$, $x^2 - 57 + 8x = 180°$.

   a) Angle Addition Postulate
   b) Definition of Bisector
   c) Both a and b
   d) None of the above

Write the logical result and which property of equality allows us to make each statement.

34-35. If a = b and b = c, then a = _____ ; _____

36-37. If b = 5 and 3 + b = c, then 3 + _____ = c ; _____

38-39. If a = b, then b = _____ ; _____

40-41. $\overline{AB}$ = _____ ; _____

42-43. Duplicate the segment below. Then, construct a perpendicular bisector of the new segment using the steps we have learned.

_____

Fill in each blank with the property used in the final step shown.

|	
44. $14x - 20 = 2(x - 4)$ $\dfrac{14x - 20}{2} = \dfrac{2(x - 4)}{2}$ Property: _____	45. $7x - 10 = x - 4$ $7x - x - 10 = x - x - 4$ Property: _____
46. $6x - 10 = -4$ $6x - 10 + 10 = -4 + 10$ Property: _____	47. $\dfrac{6x}{7} = 13$ $\dfrac{6x}{7} \times 7 = 13 \times 7$ Property: _____
48. f(x) = 3(5x + 3), and x = 5: f(5) = 3(5 × 5 + 3) Property: _____	49. $9x + 36 = 18x$ $9(x + 4) = 18x$ Property: _____

Date: _____   Start Time: _____   End Time: _____

Score:____/39

Do not use a calculator unless otherwise indicated. Figures are not drawn to scale.

Fill in the blank with the correct term.

1. A(n) _____ is a flat surface that extends in 2 directions.

2. A(n) _____ consists of two endpoints and all of the points between them.

3. A(n) _____ is a place in space with no length or width.

4. A(n) _____ is two rays with the same endpoint.

5. A(n) _____ is a straight path through at least two points.

6. _____ share a vertex and have a common side.

7. A(n) _____ has one endpoint extending indefinitely in the other direction.

Draw and label each of the following on the plane provided.
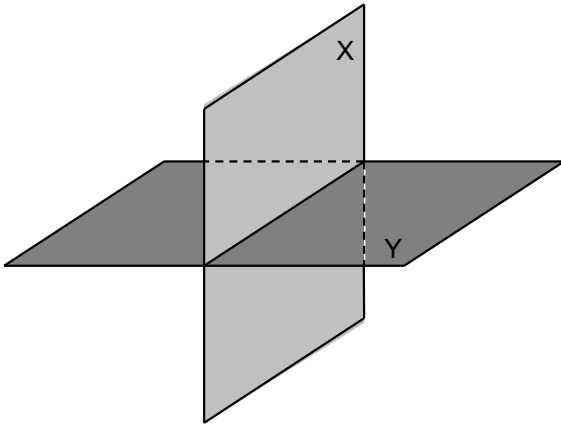
8. Draw a coplanar line segment containing three points labeled A, B, and C on Plane X.

9. Draw three collinear points labeled D, E, and F that are non-coplanar to the planes X and Y but pass through both.

10. Draw three non-collinear, coplanar points labeled G, H, and I on Plane Y.

11. Draw three non-collinear, non-coplanar points labeled J, K, and L on neither Plane X nor Plane Y.

Complete the example for each of the following properties of equality.

12. Symmetric Property

_____, so $45 = m\overline{BC}$.

13. Substitution Property

$m\angle ABC = 15x$, and $x = 2$.

$m\angle ABC =$ _____.

14. Transitive Property

If $m\angle 1 - m\angle 2 = 15°$, and $15° =$ _____,

then, _____ $= m\angle 3$.
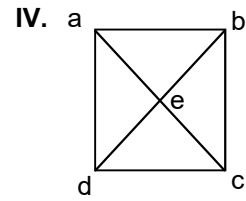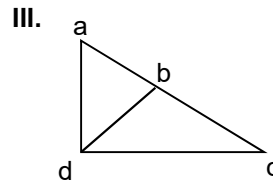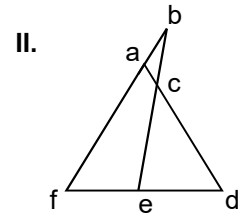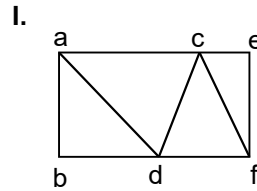
15. Reflexive Property

$10 =$ _____.

Use the segment addition postulate to match each figure to the appropriate equation.

16. $\overline{ab}+\overline{bc}\cong\overline{ac}$ _____

17. $\overline{bd}+\overline{df}\cong\overline{bf}$ _____

18. $\overline{ae}+\overline{ec}\cong\overline{ac}$ _____

19. $\overline{bc}+\overline{ce}\cong\overline{be}$ _____

I.

II.

III.

IV.

Use the angle addition postulate to solve for the angle indicated on the figure.

20. m∠ADB = 43°
     m∠BDC = 28°

     m∠_____ = _____°

21. m∠ADB = 19x°
     m∠ADC = 86°
     m∠BDC = 24x°

     m∠_____ = _____°

22. m∠BDC = x + 12°
     m∠ADC = 40°
     m∠ADB = 2x − 5°

     m∠_____ = _____°

23. m∠ADB = 30°
     m∠BDC = 2x + 6°
     m∠ADC = 5x°

     m∠_____ = _____°

24. m∠ADB = 13x − 3°
     m∠ADC = 90°
     m∠BDC = 9x + 5°

     m∠_____ = _____°

25. m∠BDC = 11x°
     m∠ADC = 170°
     m∠ADB = $x^2 + 10°$

     m∠_____ = _____°

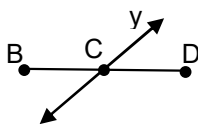**Define the following terms in your own words.**

26. Coplanar: _____

_____

27. Collinear: _____

_____

Fill in each blank box with the correct mathematical step or property used to solve for the variable. The segment addition equation is provided for each problem.

28-30. $m\overline{BC} = x + 13$
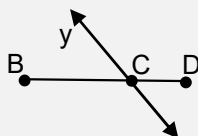
$m\overline{CD} = 3x - 21$

$m\overline{BD} = 60$

The figure

Mathematical Step	Reasoning Used
$m\overline{BC} + m\overline{CD} = m\overline{BD}$	Segment Addition POST
	Substitution PTY
4x – 8 = 60	Simplify
4x = 68	
	Division PTY

31-33. $m\overline{BC} = 8x - 2$
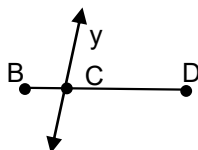
$m\overline{CD} = 3x + 3$

$m\overline{BD} = 45$

The figure

| Mathematical Step	Reasoning Used
$m\overline{BC} + m\overline{CD} = m\overline{BD}$	Segment Addition POST
8x – 2 + 3x +3 = 45	
11x +1 = 45	Simplify
11x = 44	
x = 4	

34-37. $m\overline{BC} = x + 3$

$m\overline{CD} = 3x - 9$

$m\overline{BD} = 50$

The figure

Mathematical Step	Reasoning Used
$m\overline{BC} + m\overline{CD} = m\overline{BD}$	Segment Addition POST
x + 3 + 3x – 9 = 50	
	Simplify
4x = 56	
	Division PTY

38-39. Duplicate the segment below. Then, construct a perpendicular bisector using the steps we have learned. Use a ruler to check the length of the original and duplicated segments for accuracy.
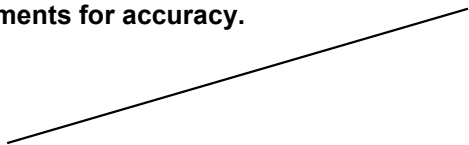
Week: 1 – Day 1

1)	F	2)	A
3)	H	4)	C
5)	B	6)	D
7)	G	8)	E
9)	2	10)	3
11)	3	12)	Plane P
13)	B, C, and F	14)	A, D, and E

Answers to question 15 may vary, but must be a flat surface in the room. An example is given.

15) The floor [A table, a wall, a book, or any other flat surface in the room could also be correct.]

16) $7 = a$

17) Line A is congruent to Line C.

18) $x + 9 = 21$

19) $6x - 30 = 26$ OR $6x - (6)(5) = 26$

20) $\overline{BC} \cong \overline{BC}$

21)	19	22)	Subtraction PTY
23)	Addition PTY	24)	3
25)	Multiplication PTY	26)	Division PTY
27)	27	28)	Addition PTY
29)	Subtraction PTY	30)	7
31)	Division PTY	32)	Multiplication PTY
33)	5 [13 – 8 = 5]	34)	81° [43 + 38 = 81]

35) $6 \left[\frac{2}{3}(18) = 12; \ 18 - 12 = 6\right]$

36) 37° [2x + 5 + x – 3 = 122°; 3x + 2 = 122°; 3x = 120°; x = 40°; ∠FEG = 40 – 3 = 37°]

For questions 37-38, the drawings are not shown to scale, but the marks needed to complete the constructions correctly are shown.

37)

38)

39) Error: Step 3
Correct:

40) Error: Step 3 [The curves should cross.]
Correct: