

Unit 01: Fundamentals of Geometry

Unit Objectives:

- Master the concepts of points, lines, segments, rays, parallel, perpendicular, angles, bisectors, midpoints, and congruent segments.
- This includes identifying, labeling, measuring, naming with correct notation, writing statements, and estimating.

Unit 01 Lesson 01: Define, Label, and Write with Points, Lines, Segments, and Congruent Segments

Lesson Objective:

1. For 5 of the 8 fundamental geometric concepts involving lines (points, lines, segments, rays)
 - a. Define (in a sentence)
 - b. Label (on a picture)
 - c. Write (as a name or statement with proper notation)

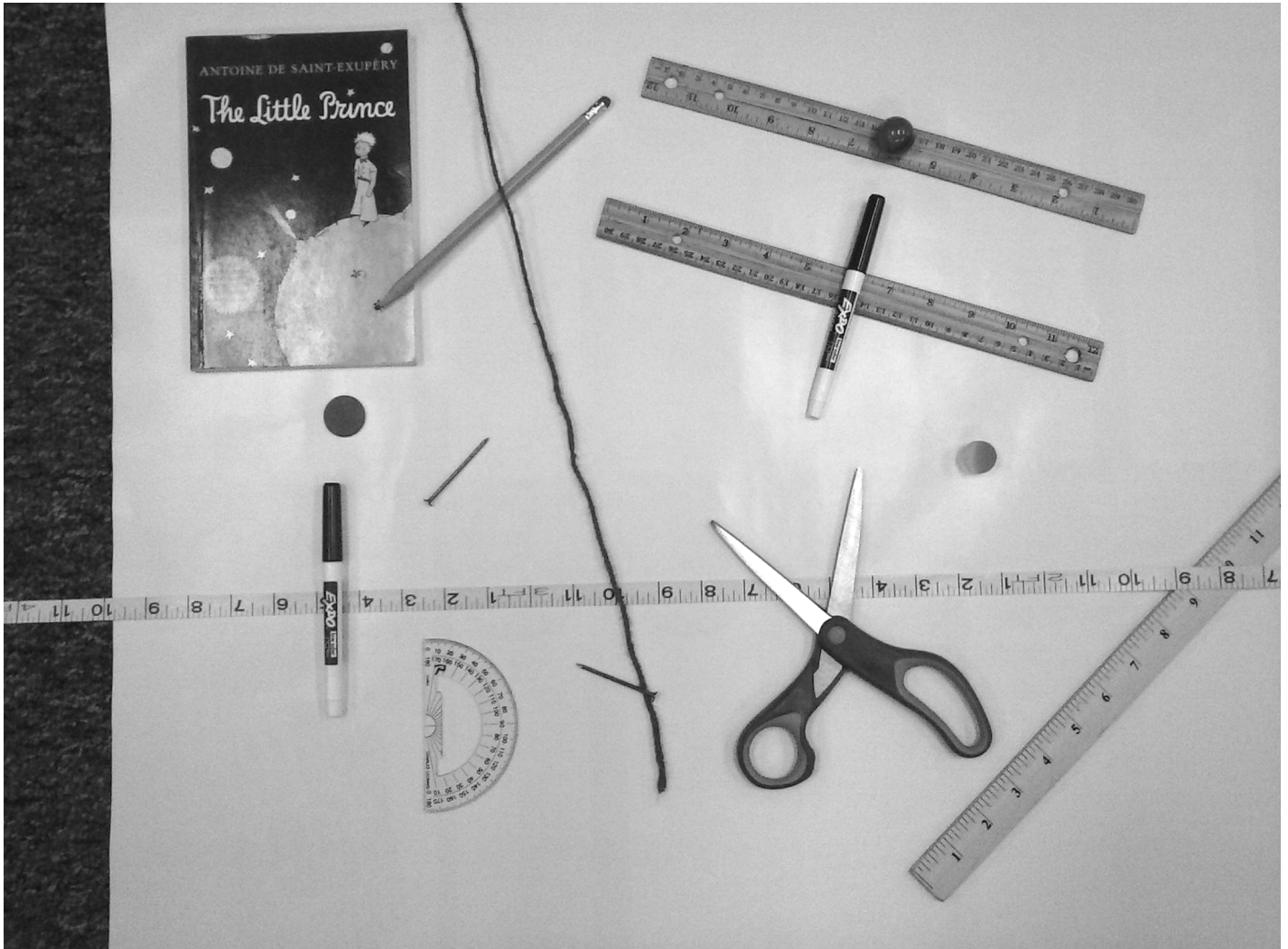
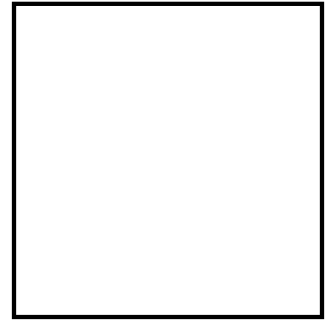


Figure 1

Concepts

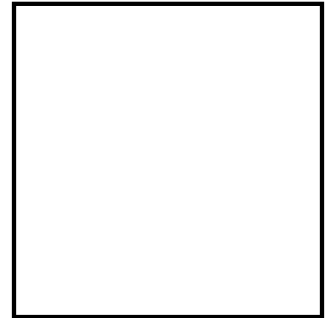
1. Point: A _____ in space. Usually used because something _____ is there. Appears as a small dot, but it doesn't actually take up any _____.

Notation:



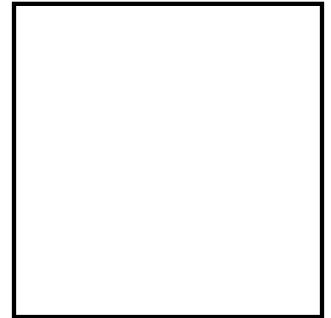
2. Line: A straight length that extends _____ in both _____.

Notation:



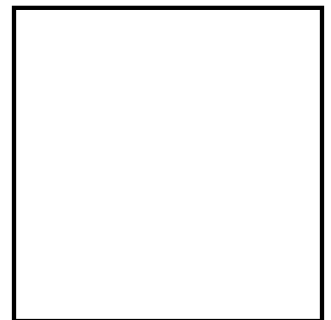
3. Line Segment: A portion of a _____ between two endpoints

Notation:



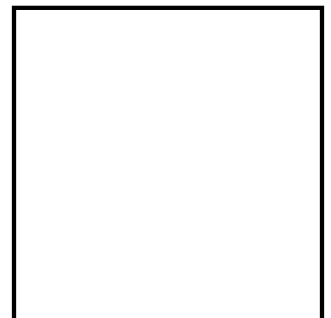
4. Congruent Segments: Two segments that have _____.

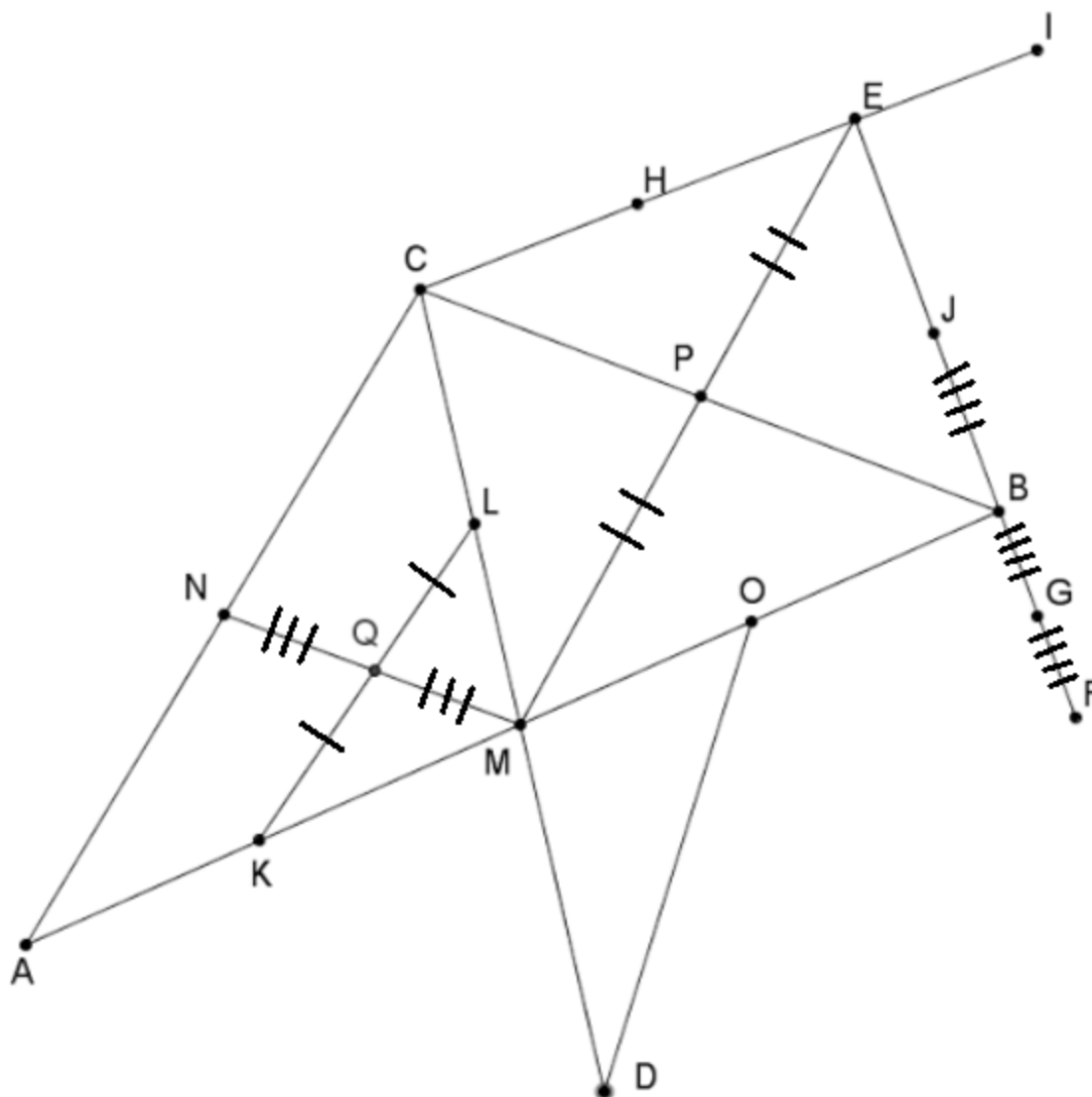
Notation:



5. Ray: A straight length that extends _____ in _____ direction.

Notation:





1. Which line segment has the same length as $\overline{MP}$? _____
2. Write a mathematical statement about the line segments that have 3 ticks. _____
3. $\overline{KQ}$ has the same _____ as _____. In geometry, we say these line segments are _____.
4. What's up with $\overline{JB}$, $\overline{BG}$, and $\overline{GF}$? _____.
5. Label the following statements on your picture
 - a. $\overline{CN}$ is the same length as $\overline{MP}$
 - b. $\overline{AK}$ is the same length as $\overline{CH}$
 - c. $\overline{OB} \cong \overline{HE}$
 - d. $\overline{KA} \cong \overline{MO}$
6. Your friend suspects $\overline{AN} \cong \overline{NC}$. Does this seem reasonable? Why?
7. Your friend suspects $\overline{AN} \cong \overline{AC}$. Does this seem reasonable? Why?

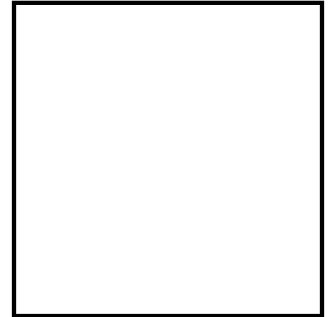
Unit 01 Lesson 02: Define, Label, and Write with Parallel Lines, Midpoints, and Bisectors

Lesson Objective:

2. For 3 of the 8 fundamental geometric concepts involving lines (parallel lines, bisectors, and midpoints), define, label, and write

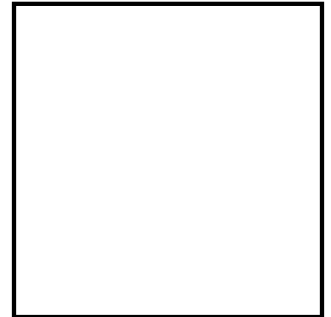
6. Parallel Lines: Lines (or rays or line segments) that always stay the same _____. These lines will never _____.

Notation:



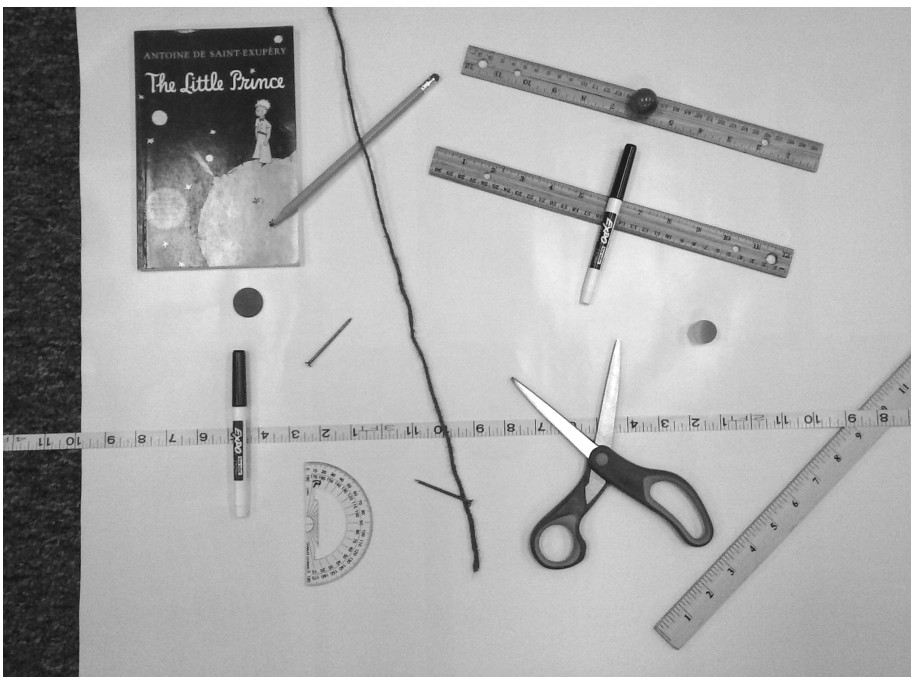
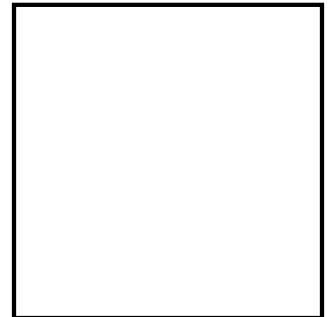
7. Midpoint: A point that _____ a line segment into two _____.

Notation:

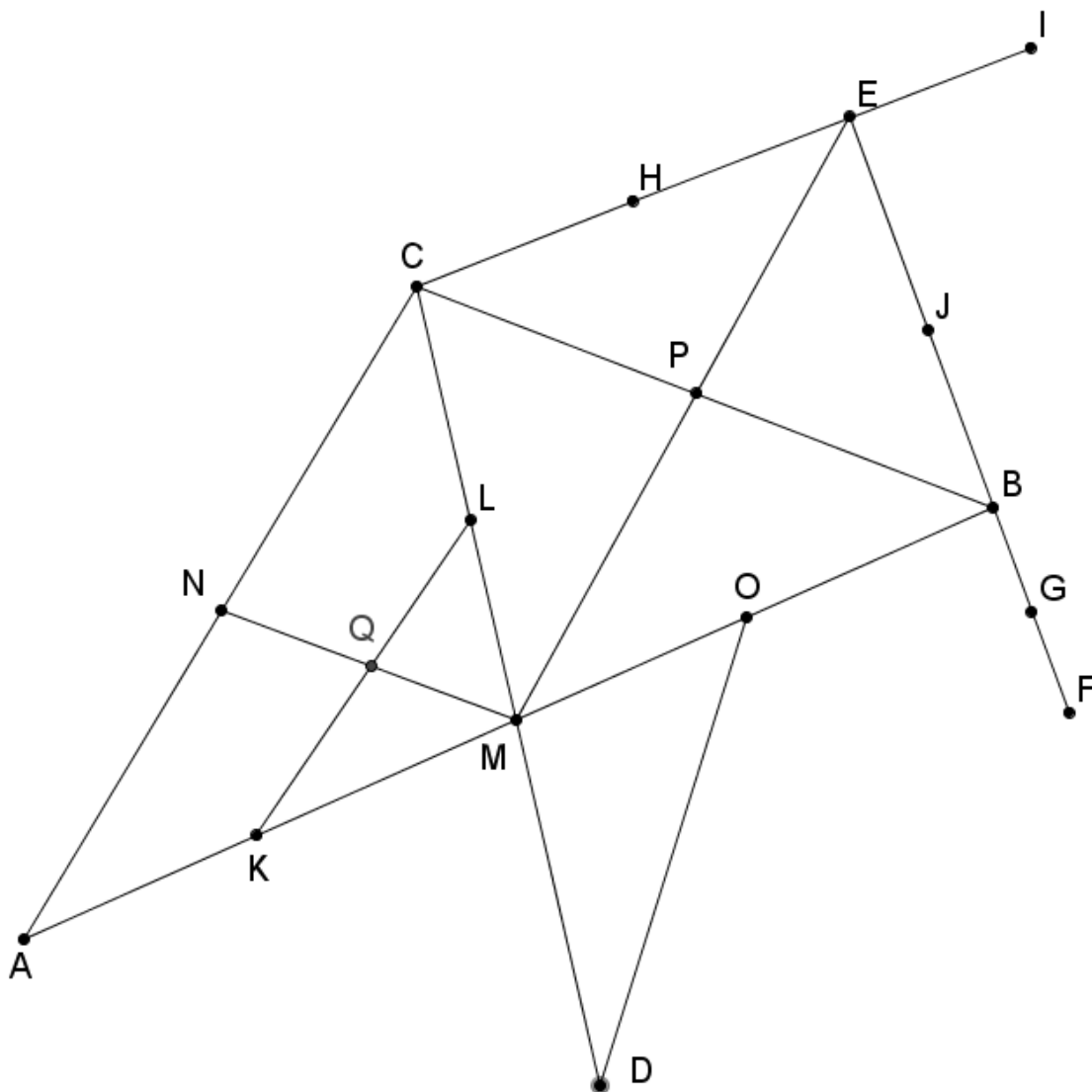


8. Bisector: A line that passes through the _____ of a line segment.

Notation:



1. Label the picture with the information given. Some information may be redundant. Circle all redundant statements.



Given

- | | | |
|---|---|---|
| a. J is the midpoint of $\overline{EB}$ | b. $\overline{LK}$ is a bisector of $\overline{AM}$ | c. $\overline{NM}$ is a bisector of $\overline{AC}$ |
| d. K is the midpoint of $\overline{MA}$ | e. $\overline{ME}$ is a bisector of $\overline{BC}$ | f. $\overline{ME}$ is a bisector of $\overline{HI}$ |
| g. $\overline{GE}$ is a bisector of $\overline{IH}$ | | |

Extra Credit

- | | | |
|---|---|---|
| h. H is the midpoint of $\overline{CE}$ | i. $\overline{DO}$ is a bisector of $\overline{MB}$ | j. $\overline{NM}$ is a bisector of $\overline{KO}$ |
|---|---|---|

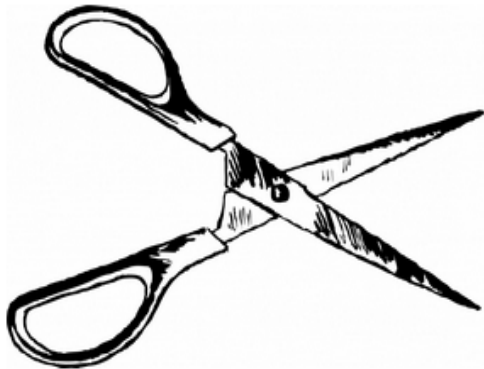
Unit 01 Lesson 03: Define, Label, and Write with Angles

Lesson Objectives

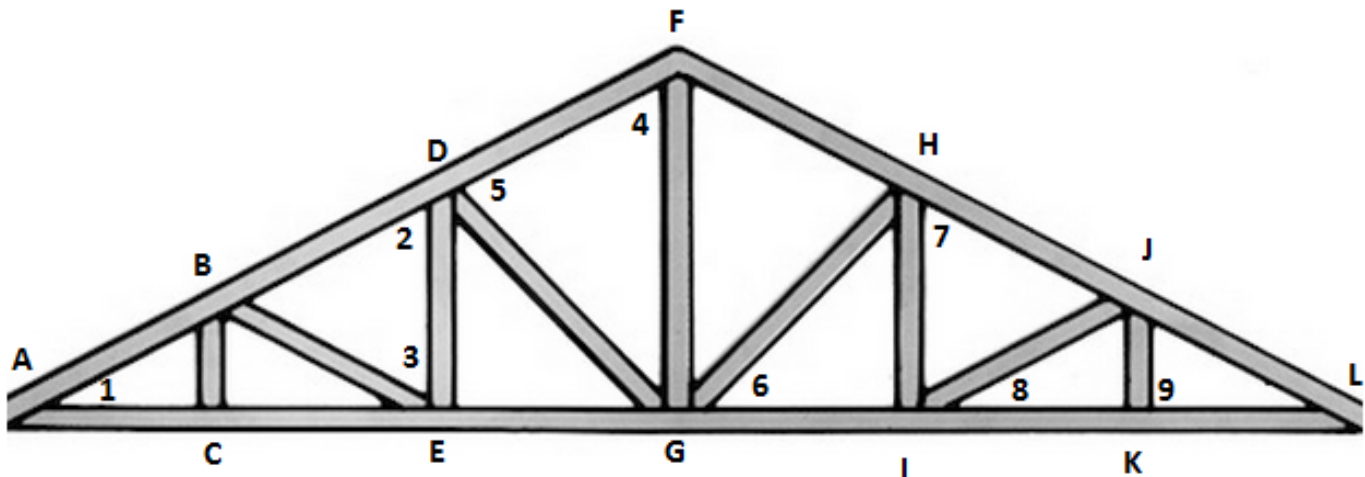
- Define, label, and write angles
- Measure angles using a protractor.
- Estimate angles visually.

Angle (physical): Two _____ that meet at a common _____ (aka _____).

Notation:

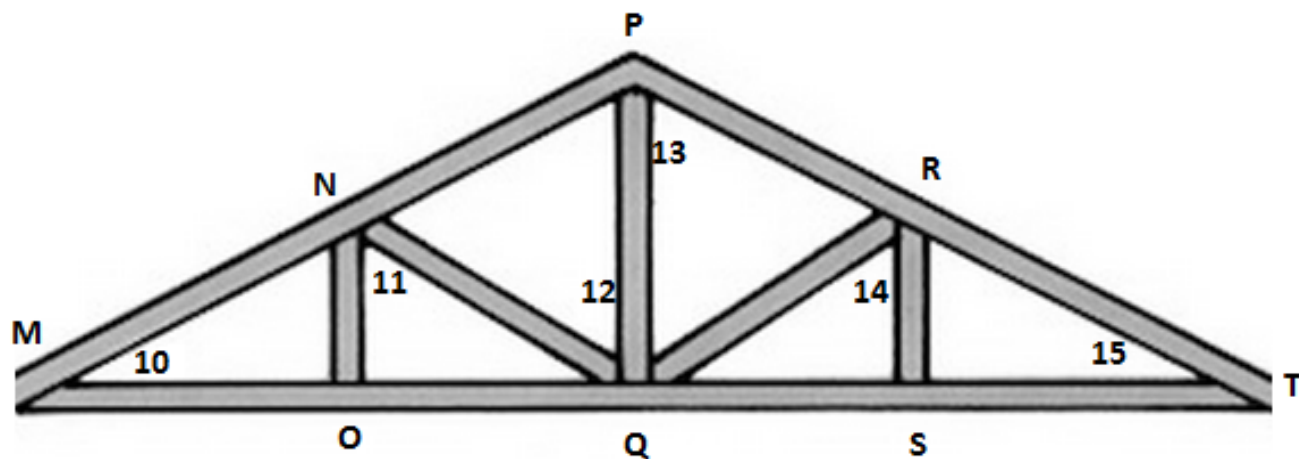


Example 1: Name each angle using A) 1-Point Notation B) 3-Point Notation (both ways) C) Numbered Angle Notation. If insufficient information is given, write N/A.



- | | | | |
|-----------------|----|----|----|
| 1. $\angle A$ | A) | B) | C) |
| 2. $\angle D$ | A) | B) | C) |
| 3. $\angle 8$ | A) | B) | C) |
| 4. $\angle FDG$ | A) | B) | C) |
| 5. $\angle LJK$ | A) | B) | C) |

Practice 1: Name each angle using A) 1-Point Notation B) 3-Point Notation (both ways) C) Numbered Angle Notation. If insufficient information is given, write N/A.



- | | | | |
|-----------------|----|----|----|
| 1. $\angle 12$ | A) | B) | C) |
| 2. $\angle QPR$ | A) | B) | C) |
| 3. $\angle T$ | A) | B) | C) |
| 4. $\angle R$ | A) | B) | C) |
| 5. $\angle QRP$ | A) | B) | C) |

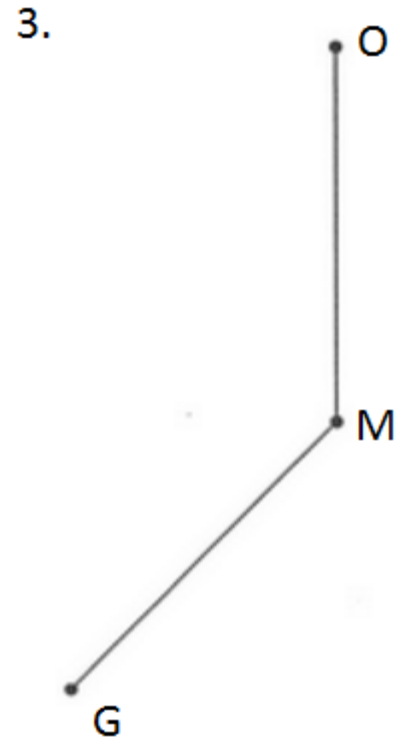
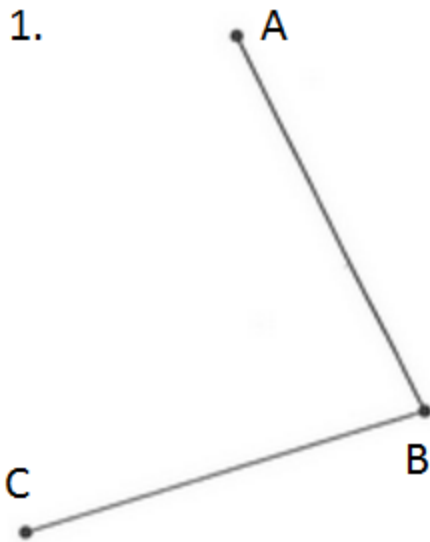
Extra Credit:

Unit 01 Lesson 04: Measure and Create Angles

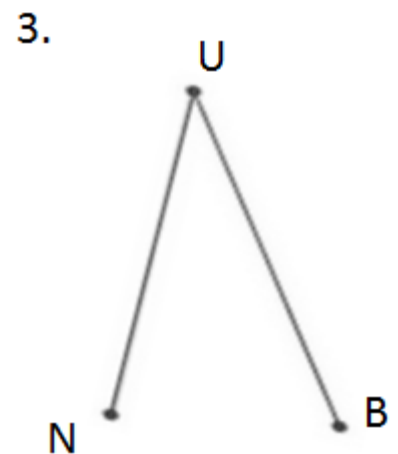
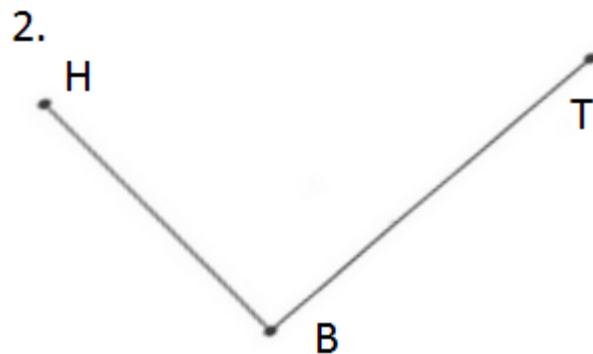
Angle (measure): The amount of _____ to turn from one _____ to the _____, where a full circle is _____.

Notation:

Example 1: Label the measures of the angles on the pictures, and state the measures of the angles shown below.



Practice 2: Label the measures of the angles on the pictures, and state the measures of the angles shown below.



Example 1: Draw the following angles. Also, label them as acute, obtuse, or right

a. $m\angle ABC = 30^\circ$

b. $m\angle QOR = 120^\circ$

Practice 2: Draw the following angles. Also, label them as acute, obtuse, or right

a. $m\angle EDF = 90^\circ$

b. $m\angle FJK = 150^\circ$

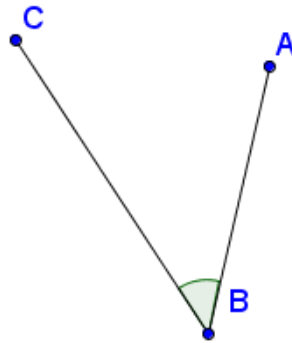
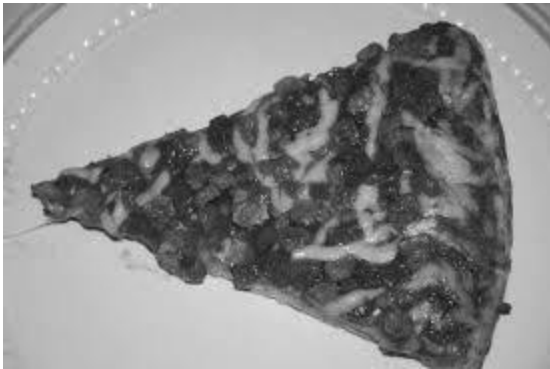
Practice 3: If $\triangle ABC$ has $m\angle ABC = 100^\circ$ and $m\angle BCA = 60^\circ$, determine the measure of $m\angle CAB$. Determine your answer by creating an accurate drawing.

Unit 01 Lesson 05: Classify Angles

Lesson Objectives

- Classify angles by their measures

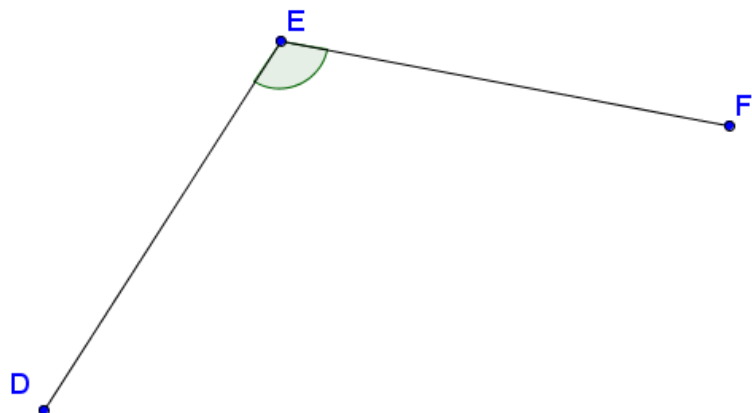
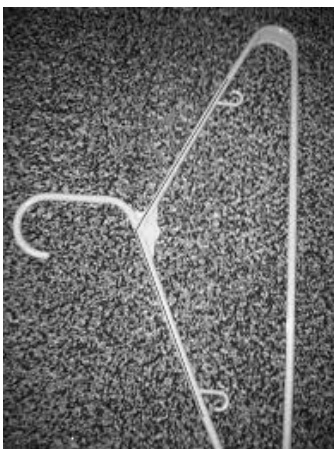
1. _____ Angle: An angle whose measure is _____.
Notation: _____



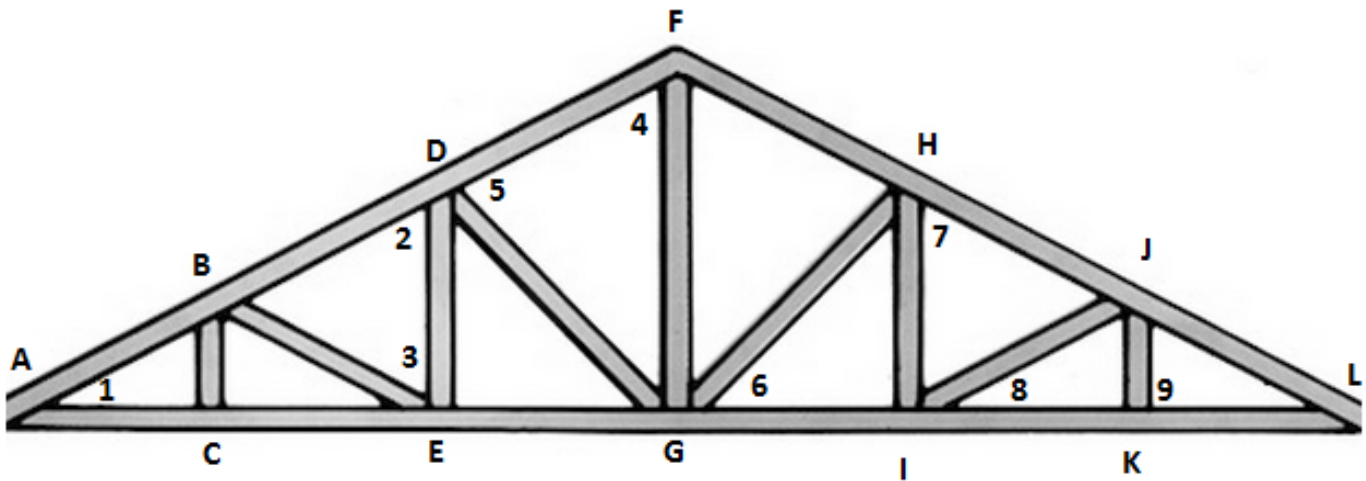
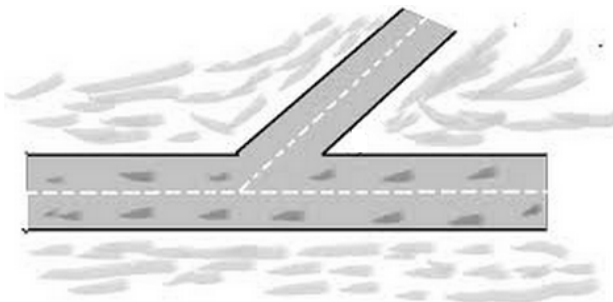
2. _____ Angle: An angle whose measure is _____.
Notation: _____



3. _____ Angle: An angle whose measure is _____.
Notation: _____



4. _____ Angle: An angle whose measure is _____.
Notation:



Example 1: Using the truss above

- | | | |
|-----------------|----------|-------|
| 1. $\angle A$ | Measure) | Type) |
| 2. $\angle DEG$ | Measure) | Type) |
| 3. $\angle 2$ | Measure) | Type) |
| 4. $\angle BDG$ | Measure) | Type) |

Practice 1: Using the truss above

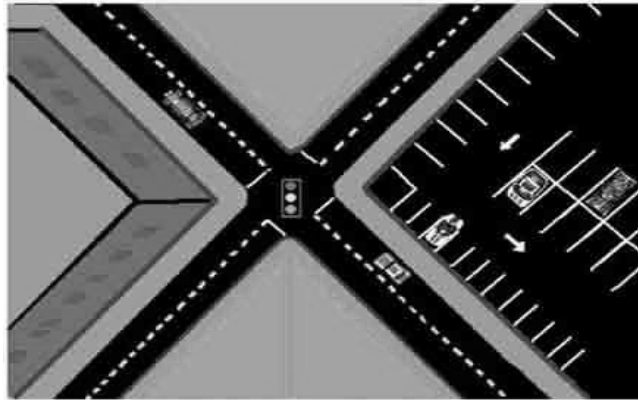
- | | | |
|-----------------|----------|-------|
| 5. $\angle 7$ | Measure) | Type) |
| 6. $\angle IJL$ | Measure) | Type) |
| 7. $\angle L$ | Measure) | Type) |
| 8. $\angle FGK$ | Measure) | Type) |

Unit 01 Lesson 06: Define, Label, Write with Perpendicular Lines and Bisectors

Lesson Objectives

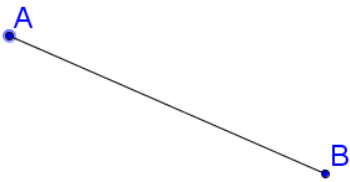
- Draw, label, define and make statements about perpendicular lines and bisectors using proper symbols and notation

1. _____ Lines: Two lines that meet at a _____.
Notation:



Example 1: Draw a line segment $\overline{CD}$ that is approximately perpendicular to the given line segment. Notate on the picture that these lines are perpendicular. State using proper notation that the line segments are perpendicular

a.

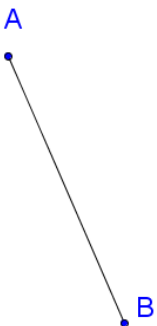


b.



Practice 1: Draw a line segment $\overline{CD}$ that is perpendicular to the given line segment. Notate on the picture that these lines are perpendicular. State using proper notation that the line segments are perpendicular.

a.



b.

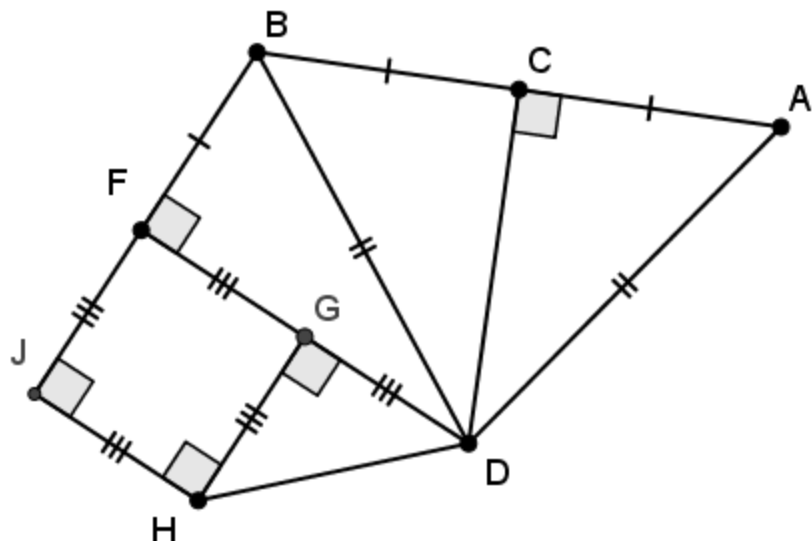


2. _____: A line that is both _____ and a _____ to another line.

Notation:



Practice 2: Find two perpendicular bisectors. For each perpendicular bisector, write (i) a congruence statement and (ii) a perpendicular statement relating to that bisector.



a. Perpendicular Bisector _____

i. _____

ii. _____

b. Perpendicular Bisector _____

i. _____

ii. _____

Unit 01 Lesson 07: Define, Label, Write with Angle Bisectors

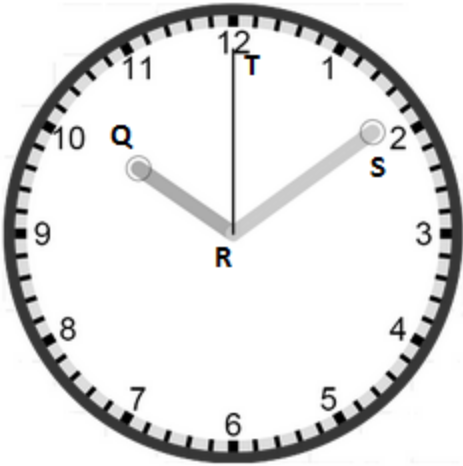
3. Angle _____: A line that divides an _____ into _____ angles.

Notation:

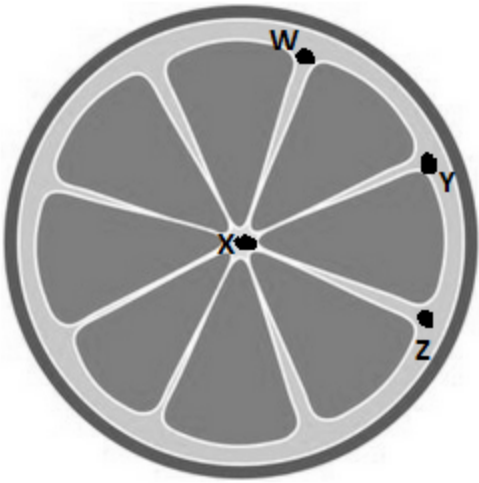


Example 2: (i) Name the line segment that appears to be an angle bisector. (ii) Notate the picture to show that this line is an angle bisector. (iii) Using proper notation, state two angles that are congruent. (iv) State the measure of one of the congruent angles (use a protractor).

a.



b.

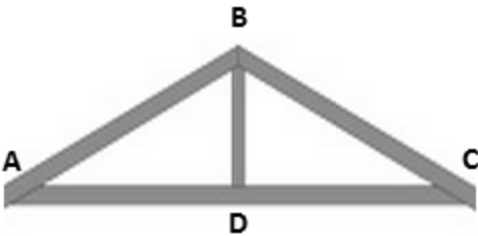


- (i) _____
- (iii) _____
- (iv) _____

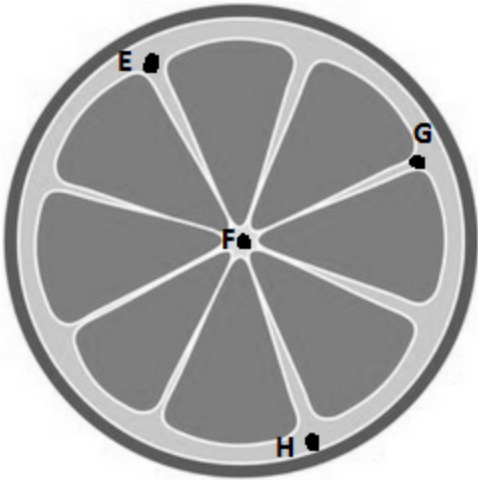
- (i) _____
- (iii) _____
- (iv) _____

Practice 3: (i) Name the line segment that appears to be an angle bisector. (ii) Notate the picture to show that this line is an angle bisector. (iii) Using proper notation, state two angles that are congruent. (iv) State the measure of one of the congruent angles using a protractor

a.



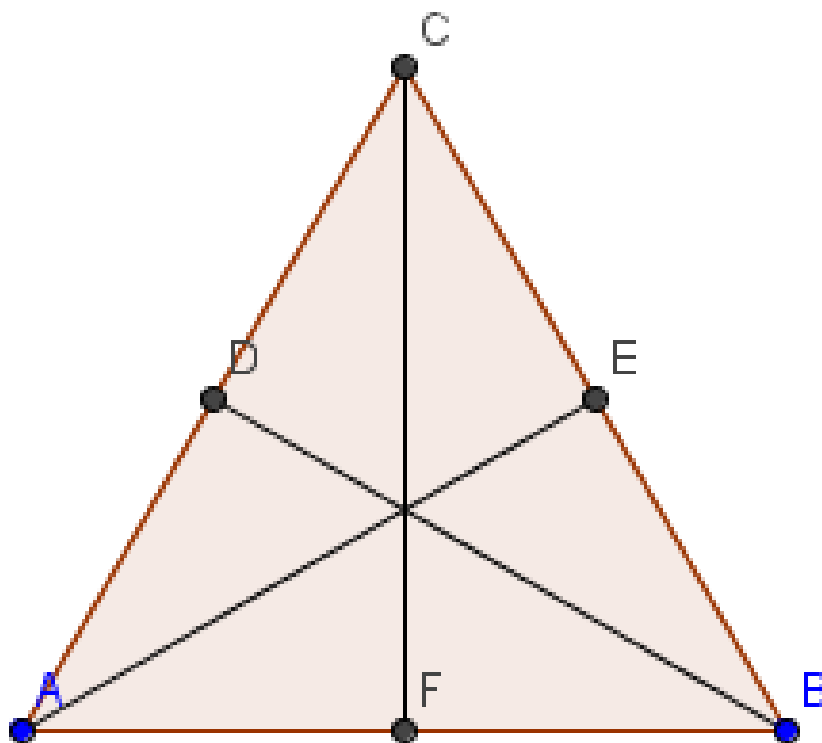
b.



- (i) _____
- (iii) _____
- (iv) _____

- (i) _____
- (iii) _____
- (iv) _____

Practice 4: Use the figure below to answer the following questions



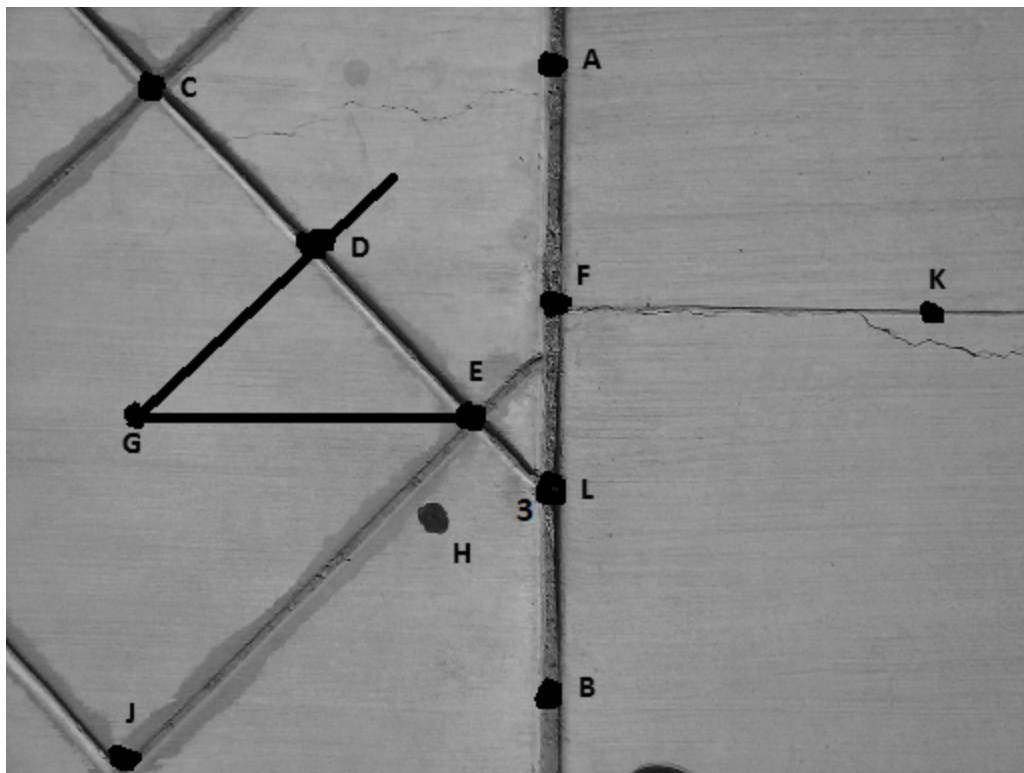
- If $\overline{AE}$ bisects $\angle CAB$, what two parts must be congruent? Write as a statement and label on the picture
- If $\overline{AE}$ bisects $\overline{CB}$, what two parts must be congruent? Write as a statement and label on the picture
- If $\overline{CF}$ bisects $\angle ACB$, what two parts must be congruent? Write as a statement and label on the picture
- If $\overline{CF}$ bisects $\overline{AB}$, what two parts must be congruent? Write as a statement and label on the picture
- If $\overline{DB}$ bisects $\angle CBA$, what two parts must be congruent? Write as a statement and label on the picture
- If $\overline{DB}$ bisects $\overline{AC}$, what two parts must be congruent? Write as a statement and label on the picture

Unit 01 Lesson 08: Review for Test

Lesson Objectives

- Demonstrate mastery of defining, naming, and measuring fundamental geometry concepts

Find examples of the following concepts, and name/state them using proper notation. Also, answer any follow up questions. Since you will be using proper notation, **you should not write a single word.**



1. a) Parallel Lines _____ b) Label the picture to show these lines are parallel
2. a) Perpendicular Lines _____ b) Label the picture to show these lines are perpendicular
3. a) Acute Angle _____ b) State the measure of this angle using proper notation: _____
6. a) Straight Angle _____ b) State the measure of this angle using proper notation: _____
8. a) _____ is a midpoint of _____ b) As a consequence of this midpoint, write a statement stating two parts are congruent: _____
9. a) _____ is a perpendicular bisector of _____ b) As a consequence of this bisector, write a statement stating two parts are congruent: _____
10. a) _____ is an angle bisector of _____ b) As a consequence of this bisector, write a statement stating two parts are congruent: _____

Name each angle using A) 1-Point Notation (B) 3-Point Notation (two ways) C) Numbered Angle Notation.

11. $\angle 3$ A) _____ B) _____ C) _____

13. $\overline{JE}$ appears to be perpendicular to $\overline{CL}$. True / False (circle one).

Practice 2: Find examples of the following concepts in the figure below. Make no assumptions. Express answers as names or statements using proper notation.

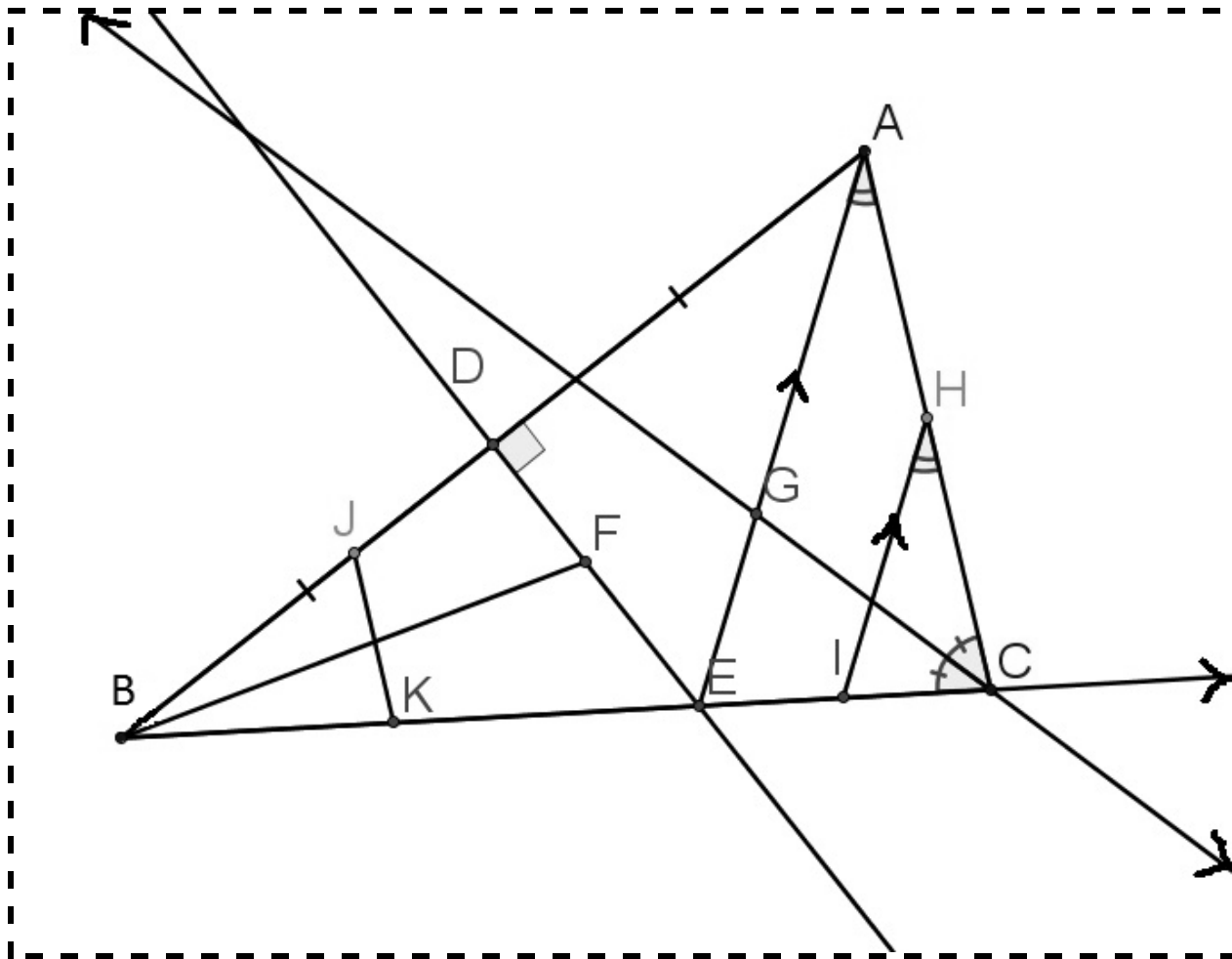


Figure 2

1. Point _____
2. Line _____
3. Line Segment _____
4. Parallel Lines _____
5. Acute Angle _____
6. Angle Bisector _____
7. Right Angle _____
8. Straight Angle _____
9. Perpendicular Lines _____
10. Ray _____
11. Bisector _____
12. Perpendicular Bisector _____
13. Midpoint _____
14. Obtuse Angle _____
15. Congruent Segments _____
16. Congruent Angles _____