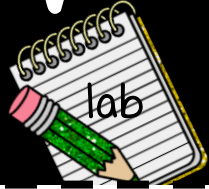


Geometry Unit I

Vocabulary, Tools & Intro to Proofs

Bundle



Digital Lessons with Paper & Pencil LABS

Learn to use
geometric
tools

Geometric Tools:

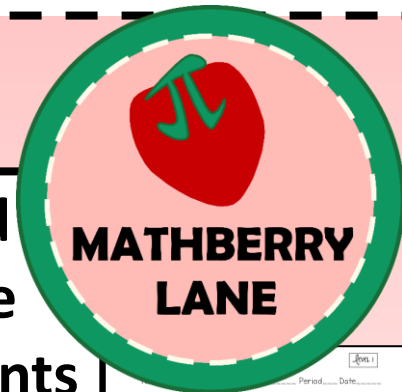
Compass: geometric tool used to construct circles and arcs



Straightedge: geometric tool used to draw segments and lines

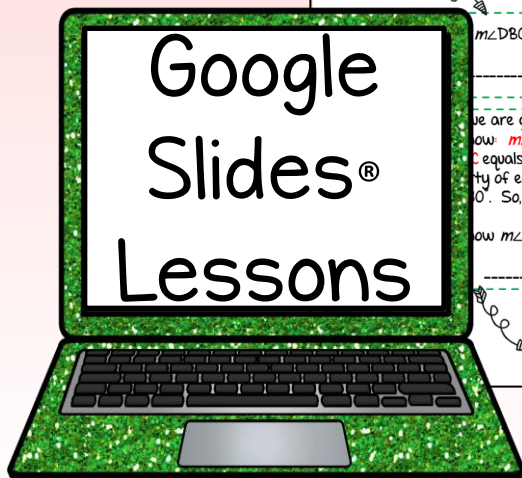


Leveled
Editable
Assessments



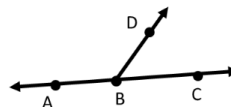
Make proofs
a breeze!

Google
Slides®
Lessons



$m\angle DBC$ form a linear pair.

What it is _____



$m\angle DBC = m\angle ABC$

We know: $m\angle ABC =$ _____

_____ Postulate

By the definition of _____

We are going to combine the ideas of the two previous boxes. We know $m\angle ABC = 180^\circ$ and $m\angle ABD + m\angle DBC = m\angle ABC$. Note that $m\angle ABD$ equals two different values. By using the substitution property of equality, we can replace $m\angle ABC$ in the second statement with 180° . So, putting this altogether:

Now $m\angle ABD + m\angle DBC =$ _____

_____ property of equality.

$m\angle ABD$ and $m\angle DBC$ are supplementary.

By the definition of _____

- Lesson 1: Undefined Terms
- Lesson 2: Geometric Vocabulary
- Lesson 3 Lab*: Using Geometric Tools
- Lesson 4: Types of Angles
- Lesson 5: Algebra and Angles
- Plus Leveled Assessments!

Unit 1: Geometric Vocabulary, Notation & Tools

Lesson 1: Undefined Terms & Learning to Draw Digitally

Lesson 2: Geometric Vocabulary

Lesson 3 Lab*: Using Geometric Tools

Lesson 4: Angle Pair Relationships

Lesson 5: Algebra and Angles

Unit Assessment:

2 Leveled Assessments aligned to Common Core

Answer Key

Scoring Rubric

Leveled Assessments

Unit 1 Assessment

Common Core State Standards:

[CCSS.MATH.CONTENT.HSG.CO.A.1](#)

Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

[CCSS.MATH.CONTENT.HSG.CO.C.9](#)

Prove theorems about lines and angles. *Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.*

[CCSS.MATH.CONTENT.HSG.CO.D.12](#)

Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). *Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.*

[CCSS.MATH.CONTENT.HSA.REI.A.1](#)

Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

[CCSS.MATH.CONTENT.7.G.B.5](#)

Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.



Leveled Assessments

Grading Rubrics

Answer Key

Aligned to Common Core

Unit 1: Geometric Vocabulary, Tools & Intro to Proofs

Lesson 1: Undefined Terms

Lesson 2: Geometry Vocabulary & Notation

Lesson 3 Lab*: Using Geometric Tools

Lesson 4: Angle Pair Relationships

Lesson 5: Algebra and Angles

LEVELED ASSESSMENTS: 14 EDITABLE PAGES



Lesson 1: Undefined Terms: *learning to draw digitally*

- This activity starts by identifying the three undefined terms in Euclidean geometry along with sample ways to notate each figure. The lesson continues to teach students how to draw and label each term in the lesson by using the drawing tools in google slides to create them. The lesson ends with a brief formative self assessment.
- If you would prefer for your students to not have the answers as they work, then simply delete the answer slides before sharing the file with your students.
- Note: Lesson format is compatible with Google slides®
- 27 slides; 3 instructional pages
- Estimated Instructional Time: 45 minutes

[CCSS.MATH.CONTENT.HSG.CO.A.1](https://www.illustrativemathematics.org/HS-Geometry/HS-Geometry-Content/HS-Geometry-Content-1)

Lesson 2: Geometry Vocabulary: *learning to draw* *DIGITALLY*

- This resource defines essential geometry terms. Students then have the opportunity to practice drawing the figures in google slides. The lesson ends with a formative self assessment where students practice defining and classifying terms.
- If you would prefer for your students to not have the answers as they work, then simply delete the answer slides before sharing the file with your students.
- Note: Lesson format is compatible with Google slides®
- 31 slides, 4 instructional pages
- Estimated Instructional Time: 45 minutes

[CCSS.MATH.CONTENT.HSG.CO.A.1](#)

Lesson 3: Using Geometric Tools: digital lesson with Paper and Pencil Lab

- **Materials needed**

compass; straightedge/ruler; string; mirror; paper/tracing paper; printed paper and pencil lab handout.

- If tracing paper is available, it may be easier for the paper folding activity. Or have students hold paper up to the light or a window.
- This lesson introduces using geometric tools. Students learn about the different types of geometric tools in google slides® and then practice using the tools by completing a paper and pencil lab. The lesson is differentiated by providing lots of choices for what to create.

[CCSS.MATH.CONTENT.HSG.CO.A.1](#)

[CCSS.MATH.CONTENT.HSG.CO.D.12](#)

Continued on next Page...

Lesson 3: Continued...

- All geometric tools are practiced except for using geometric software.
- You can access a **free lesson** for using geometric software here:

Getting Started with
Geometry Software

- Tip: The paper and pencil lab may be set up in stations for students to rotate through.
- 22 slides + 3 pages instructions+ 8 printables+3answer key
- Estimated Instructional Time: 40 minutes

Lesson 4: Angle Pair Relationships – Notes & INTRO to PROOF

- This reviews different angle pair relationships from grade 7 geometry:
 - Adjacent Angles
 - Complementary Angles
 - Supplementary Angles
 - Vertical Angles
 - Linear Pairs
- The lesson then continues to extend the vocabulary to key words for writing proofs, such as axiom, postulate, and theorem, followed by the angle addition postulate and segment addition postulate.
- Practice Digital Drawing with linear pairs and vertical angles
- Online exploration activities to discover that linear pairs form supplementary angles and that vertical angles have equal measure.

[CCSS.MATH.CONTENT.7.G.B.5](#)

[CCSS.MATH.CONTENT.HSG.CO.C.9](#)

Continued on next Page...

Lesson 4: Continued...

- Students make conjectures based on the exploration followed by brainstorming how to prove their statement. Turn & talk to a neighbor to get the most brainstorming ideas.
- Students are walked through their very first set of proofs!
- The lesson ends with a quick formative self assessment recapping key aspects of the lesson.
- Practice exercises give students the opportunity to distinguish between statements and reasons, better preparing them to write proofs.
- Tip: use scrap paper or white boards for students to sketch figure on for processing or brainstorming.
- If you would not like your students to have the answers to grade as they go, simply delete those slides before sharing the file with your students.

- 43 slides + 4 pages instructions + 2 GeoGebra explorations
- Estimated Instructional Time: 45 minutes

Lesson 5: Algebra and Angles – Getting Ready for Proofs

- Pre-requisite skills:
 - Definition of Supplementary Angles; Vertical angles have equal measure; linear pairs are supplementary.
- This lesson reviews solving algebraic equations from Algebra with a slight twist. Students are asked to justify each step for solving the equation with a property of equality.
- The lesson continues to introduce the reflexive, symmetric and transitive properties of equality.
- Finally, students combine their algebra and geometry skills to solve for unknown angle measures.
- The lesson ends with a quick self assessment followed by practice problems to solve for missing angle measures.
- Note: Lesson format is compatible with Google slides®

- If you would not like your students to have the answers to grade as they go, simply delete those slides before sharing the file with your students.

- 52 slides + 4 pages instructions
- Estimated Instructional Time: 90 minutes

[CCSS.MATH.CONTENT.HSA.REI.A.1](#)

[CCSS.MATH.CONTENT.7.G.B.5](#)

1

Lesson

Undefined Geometric Terms:

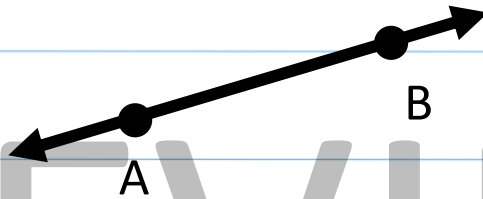
Euclidean Geometry has 3 undefined terms.

Point



Read as Point A

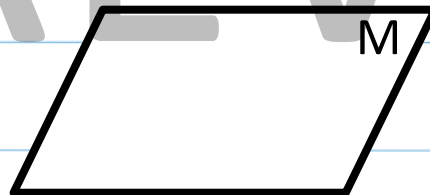
Line



Read as line AB

Notation: \overleftrightarrow{AB}

Plane



Read as Plane M

Geometry Vocabulary:

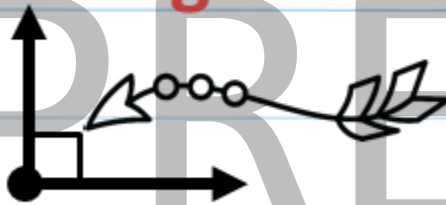
Obtuse Angle: an angle that measures between $90^\circ - 180^\circ$



Straight Angle: an angle that measures 180°



Right Angle: an angle that measures 90°



The box symbol indicates a right angle.

Reflex Angle: an angle that measures between $180^\circ - 360^\circ$



2

Lesson

Learning to Draw Digitally:

Your task is to draw a **segment**, **ray** and an **angle**. Each figure should be properly labeled.

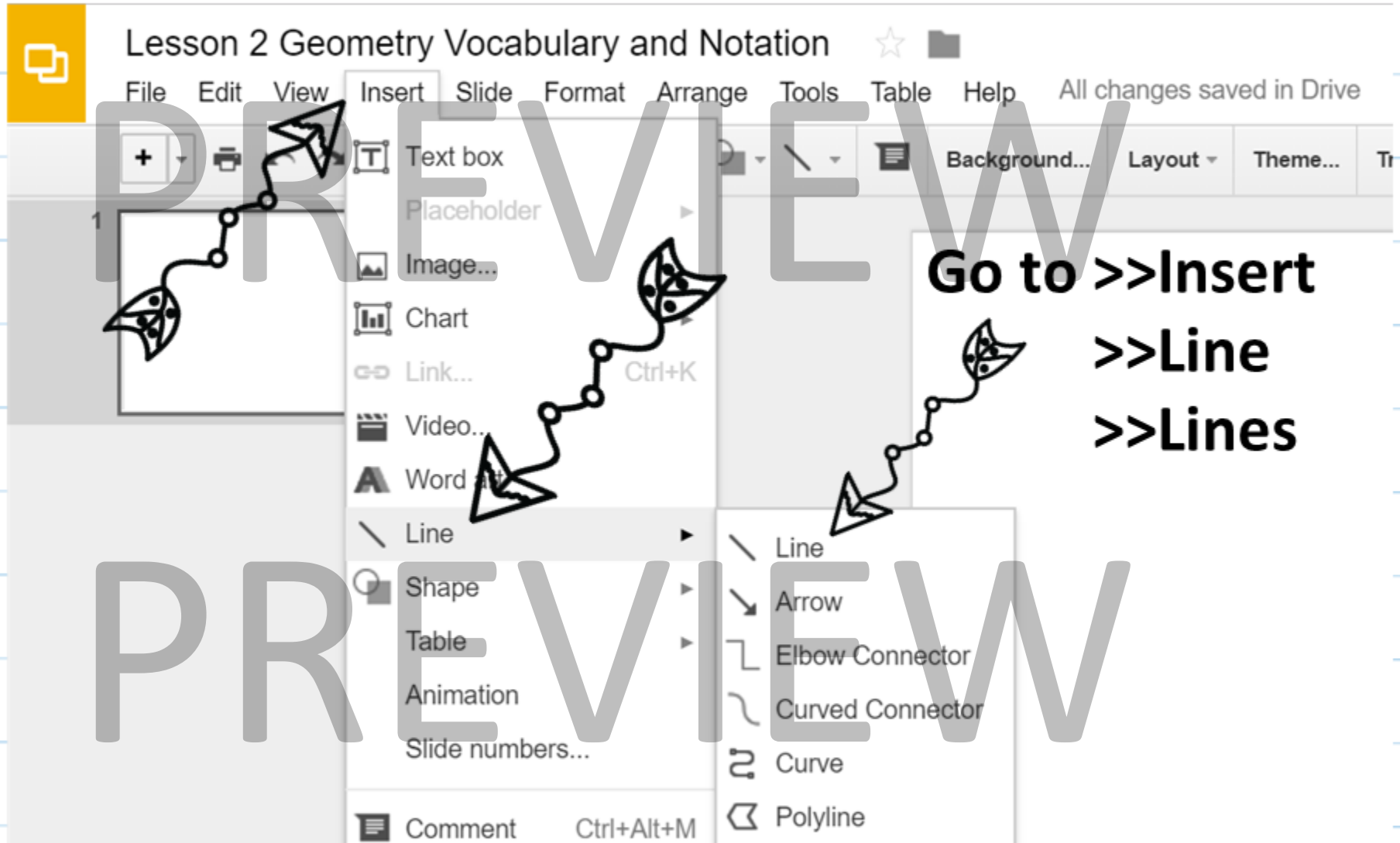
The following slides provide directions for learning how to draw shapes in Google slides.

After reading through the directions for each figure, practice **drawing** and **labeling** them.

2

Lesson

Digital Drawing: Segment



Click on the screen and hold the left button as you move the cursor to where you would like the other end of the segment to be.

3

Lesson

Using Geometric Tools:

Required Materials:

- Compass
- Straightedge/Ruler
- Paper/Tracing paper
- String
- Mirror

PREVIEW

Geometric Tools:

Compass: geometric tool used to construct circles and arcs



Straightedge: geometric tool used to draw segments and lines



Paper and Pencil Lab: Straightedge

Your task is to use a straightedge to draw one or more of the following:

- Triangle
- House
- Railroad tracks
- Honeycomb
- Clapperboard
- Stop sign
- Cube
- Or your own idea!



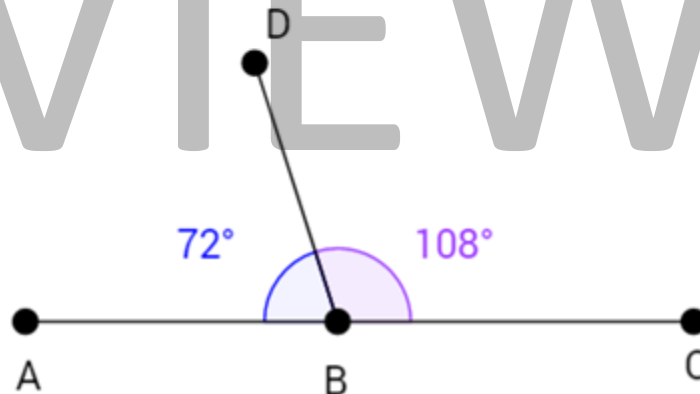
Linear Pair Exploration

Problem 3: Find the angle measure of 4 different linear pairs.

Go to [this](#) web page.

Click on point D and move it to change the angle. Record 4 different angle measures on the next slide.

Linear Pair Exploration



Set 1

Set 2

Set 3

Set 4

$\angle ABD = \text{-----}$

$m\angle ABD = \text{-----}$

$m\angle ABD = \text{-----}$

$m\angle ABD = \text{-----}$

$\angle CBD = \text{-----}$

$m\angle CBD = \text{-----}$

$m\angle CBD = \text{-----}$

$m\angle CBD = \text{-----}$

Make 2 or more observations about the angles and their measures.

Turn and talk to a neighbor to share observations. Based on the observations, make a conjecture about the sum of the two angles of a linear pair.

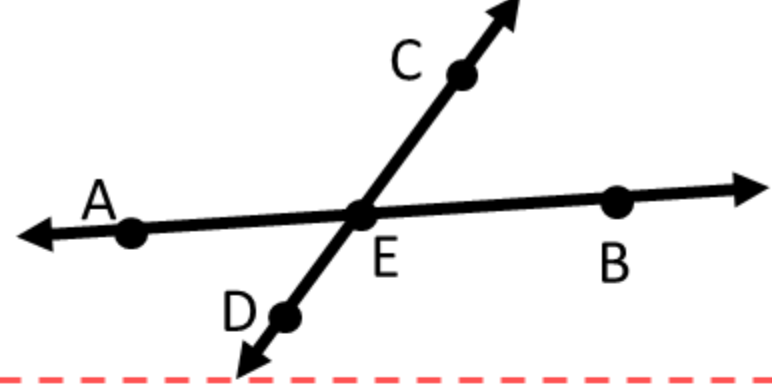
If two angles form a linear pair, then-----.

4

Lesson

and $\angle BEC$ are vertical angles.

The fact that it is _____.



Now: $m\angle AED + m\angle AEC = m\angle DEC$

Now: $m\angle CEB + m\angle AEC = m\angle AEB$

We know $m\angle DEC = 180^\circ$

We know $m\angle AEB = 180^\circ$

By the _____ Postulate

By the definition of _____

Time to use that awesome brain power again! How can you use the substitution property of equality in the next step?



I'll get you started. Let's focus on what we know from above. Since we know...

$m\angle DEC =$ _____ and $m\angle DEC =$ _____ then it follows that...

$m\angle AED + m\angle AEC =$ _____ by the _____ property of equality.

When solving, you undo what is done to the variable by REVERSING the order of operations.

When you SOLVE an equation you follow the order of operations in REVERSE order:

Parenthesis

Exponents

Multiplication

Division

Addition

Subtraction

Undo Multiplication and Division

Undo Addition and Subtraction

Start by undoing Addition and Subtraction first!

Solve

5

Lesson

Solving:

Example: Solve for x.

$$(3x+1) - 4 = 12$$

Start by undoing -4 by adding 4 to each side.

It might look like you should undo -4 here, but don't undo what's inside the parenthesis until you've undone everything else.

$$\begin{array}{r} (3x+1) - 4 = 12 \\ + 4 \quad + 4 \\ \hline \end{array}$$

$$3x+1 = 16$$

Next we can undo $+1$ by adding 1 to each side.

$$\begin{array}{r} 3x+1 = 16 \\ -1 \quad -1 \\ \hline \end{array}$$

$$3x = 15$$

$$3x + 1 = 16$$
$$3x + 1 - 1 = 16 - 1$$
$$3x = 15$$

Finish by dividing each side by 3 to undo multiplying by 3.

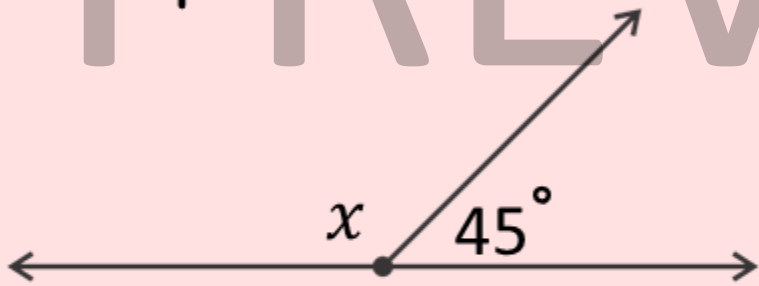
$$\frac{3x}{3} = \frac{15}{3}$$

$$x = 5$$

Solving: Find the missing angle.

Directions: Solve for the missing angle below. Justify each step of your solution. An example is done for you!

Example:



Justifications

$$\begin{array}{r} x + 45 = 180 \\ -45 \quad -45 \\ \hline \end{array}$$

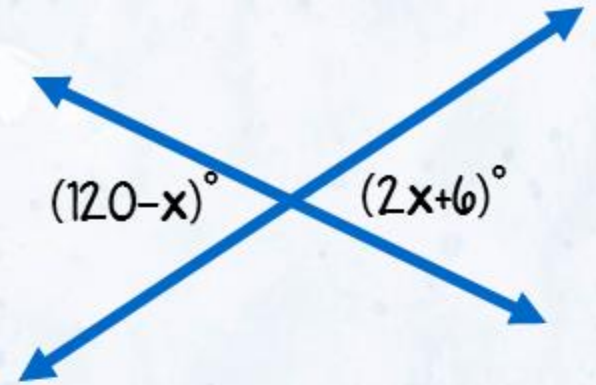
$$x = 135^\circ$$

Linear pairs are supplementary.
Subtraction Property of Equality

5

Practice

Exercise #2: Fill in the blanks to justify the solution below. Find the missing angle.



1

Steps

Justifications

$$(114-x)^\circ = (2x+6)^\circ$$

$$-6^\circ$$

PREVIEW

$$(114-x)^\circ = (2x)^\circ$$

$$+x \quad +x$$

PREVIEW

$$\frac{114^\circ}{3} = \frac{3x^\circ}{3}$$

PREVIEW

$$38^\circ = x^\circ$$

$$\text{Missing Angle} = (120 - 38)^\circ$$

$$= 82^\circ$$

PREVIEW

Digital GEOMETRY Curriculum:

- ✓ 1) Geometry Vocabulary, Tools & Intro to Proofs
- ✓ 2) Constructions

Works In Progress..

3) Parallel Lines

4) Transformations

5) Congruence

6) Similarity

7) Trigonometry and Right Triangles

8) Volume & Surface Area

9) Circles

10) Coordinate Geometry

11) Geometric Probability

Digital Lessons with Paper & Pencil LABS

Thank you for your purchase!

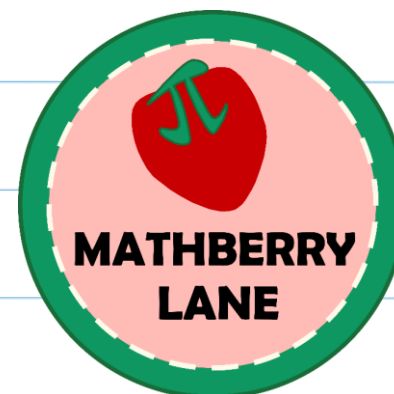
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