Eureka Math

4th Grade
Module 4
Lesson 11

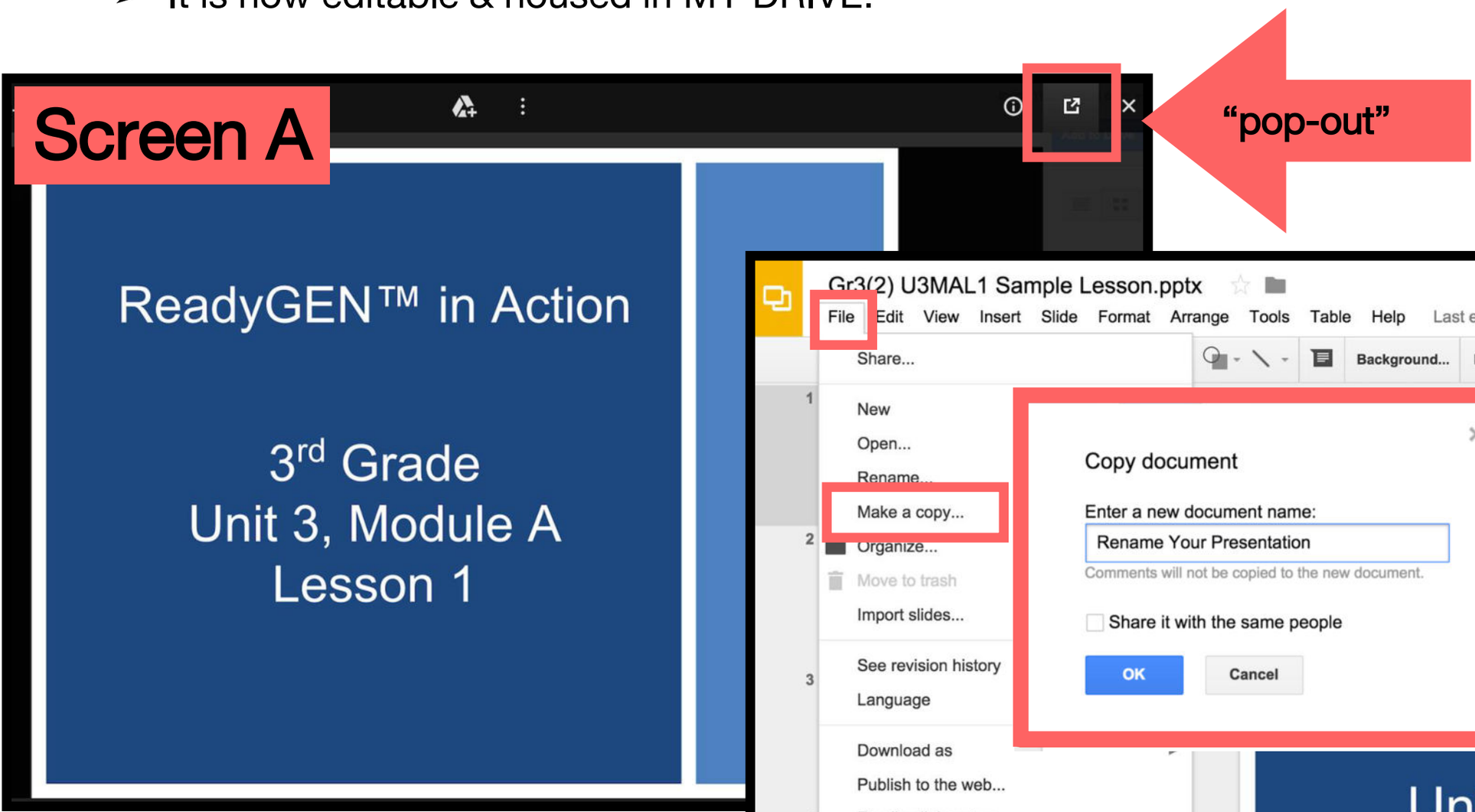
At the request of elementary teachers, a team of Bethel & Sumner educators met as a committee to create Eureka slideshow presentations. These presentations are not meant as a script, nor are they required to be used. Please customize as needed. Thank you to the many educators who contributed to this project!

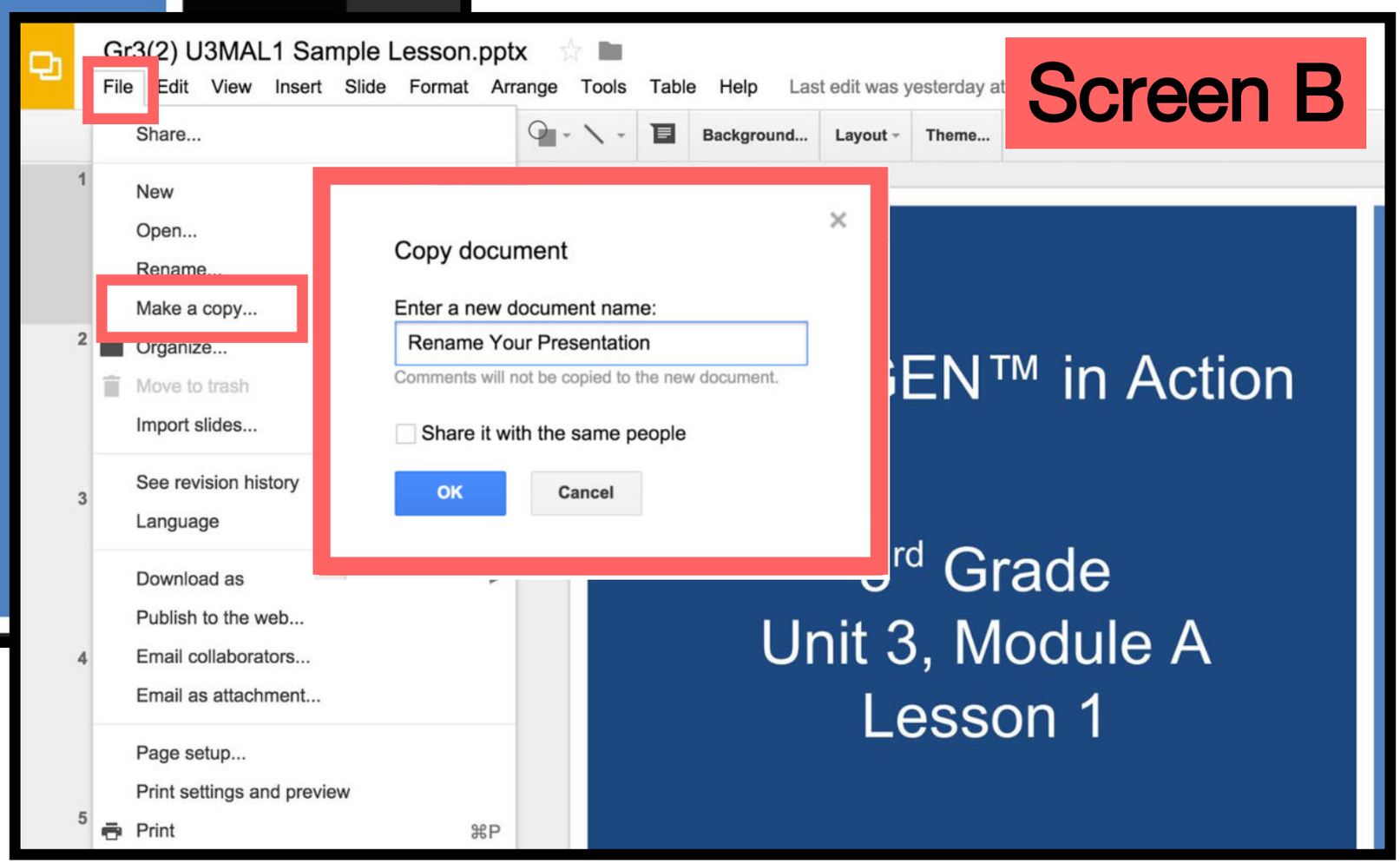
Directions for customizing presentations are available on the next slide.

Customize this Slideshow

Reflecting your Teaching Style and Learning Needs of Your Students

- When the Google Slides presentation is opened, it will look like Screen A.
- Click on the “pop-out” button in the upper right hand corner to change the view.
- The view now looks like Screen B.
- Within Google Slides (not Chrome), choose FILE.
- Choose MAKE A COPY and rename your presentation.
- Google Slides will open your renamed presentation.
- It is now editable & housed in MY DRIVE.



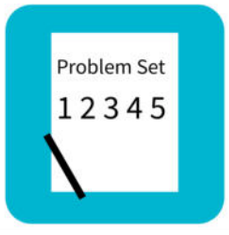


Icons

Read, Draw, Write

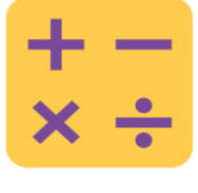
Learning Target

Personal White Board



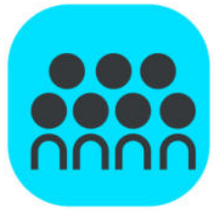
Problem Set

Manipulatives Needed



Fluency

Think Pair Share



Whole Class

Individual

Partner

Small Group

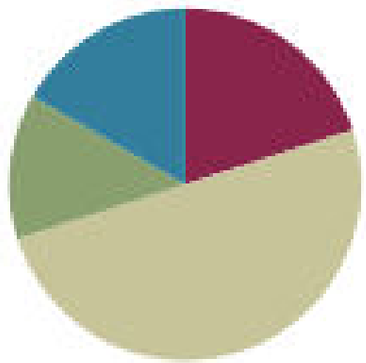
Small Group Time

Lesson 11

Objective: Use the addition of adjacent angle measures to solve problems using a symbol for the unknown angle measure.

Suggested Lesson Structure

Fluency Practice	(12 minutes)
Application Problem	(8 minutes)
Concept Development	(30 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**



Objective: Use the addition of adjacent angle measures to solve problems using a symbol for the unknown angle measure.

Divide Different Units

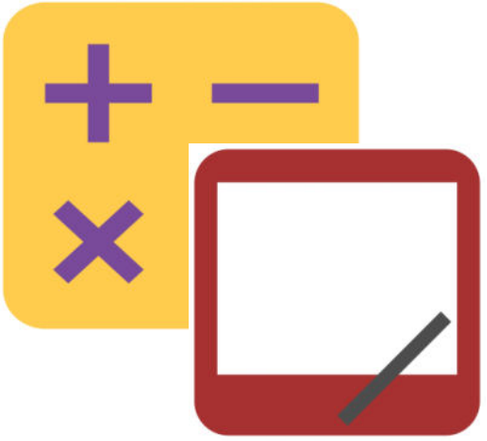
$$6 \div 2 =$$

Say the division sentence in unit form.

Divide Different Units

$$60 \div 2 =$$

Say the division sentence in unit form.



Divide Different Units

$$600 \div 2 =$$

Say the division sentence in unit form.

Divide Different Units

$$6{,}000 \div 2 =$$

Say the division sentence in unit form.

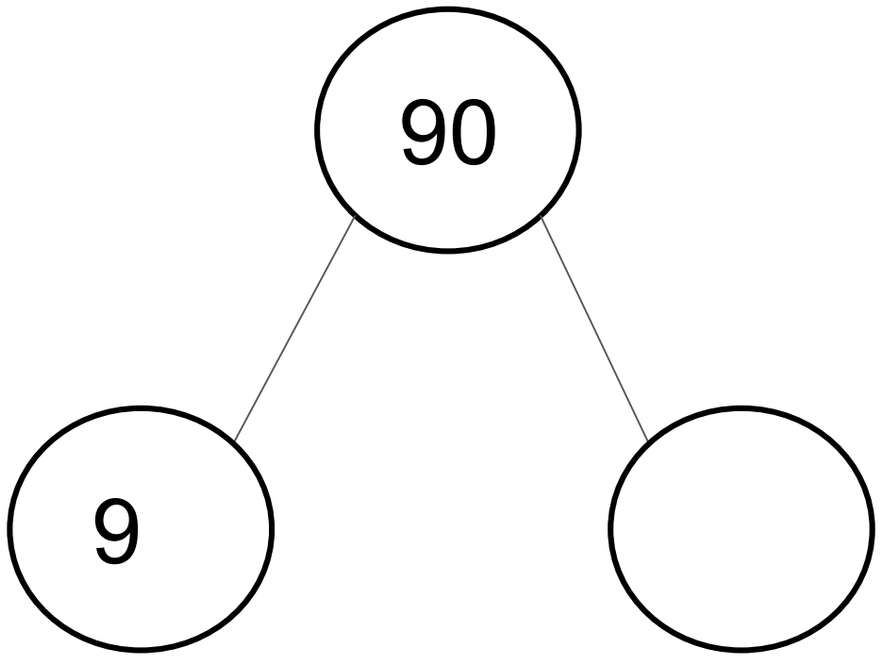
Divide Different Units

8 tens ÷ 2 =

On your personal white boards, write the division sentence in standard form.

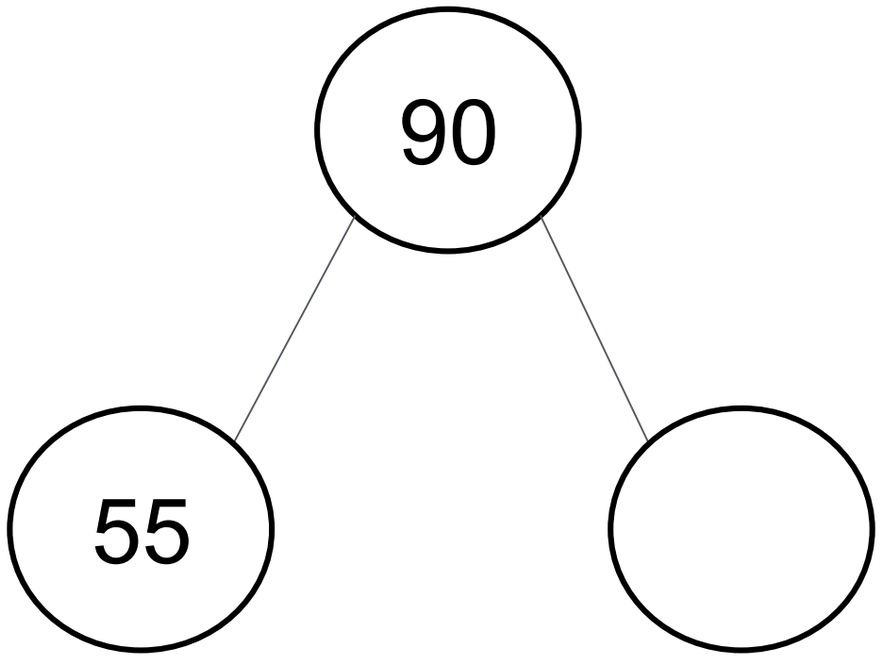
Continue with the following possible sequence: 8 tens ÷ 2, 25 tens ÷ 5, 12 hundreds ÷ 4, 24 hundreds ÷ 4, 27 tens ÷ 3, 32 tens ÷ 4, 30 tens ÷ 5, and 40 hundreds ÷ 5.

Break Apart 90, 180, and 360



On your personal white boards, write the number bond, filling in the unknown part.

Break Apart 90, 180, and 360



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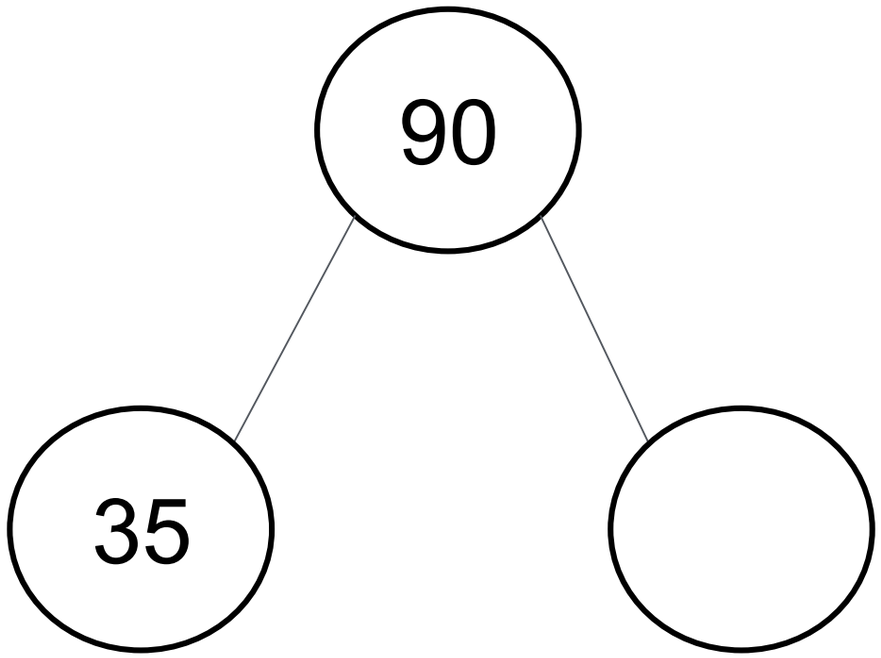

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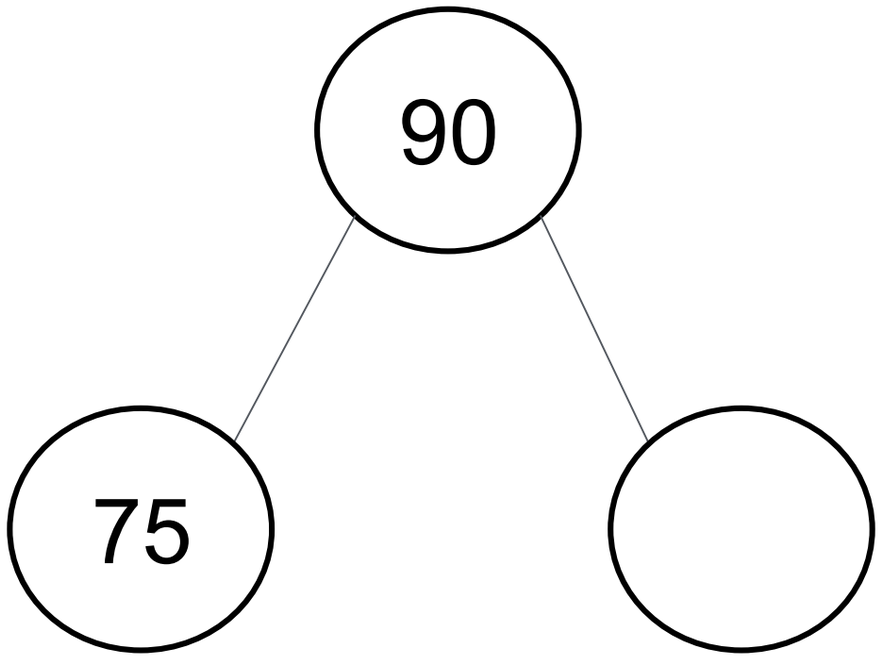

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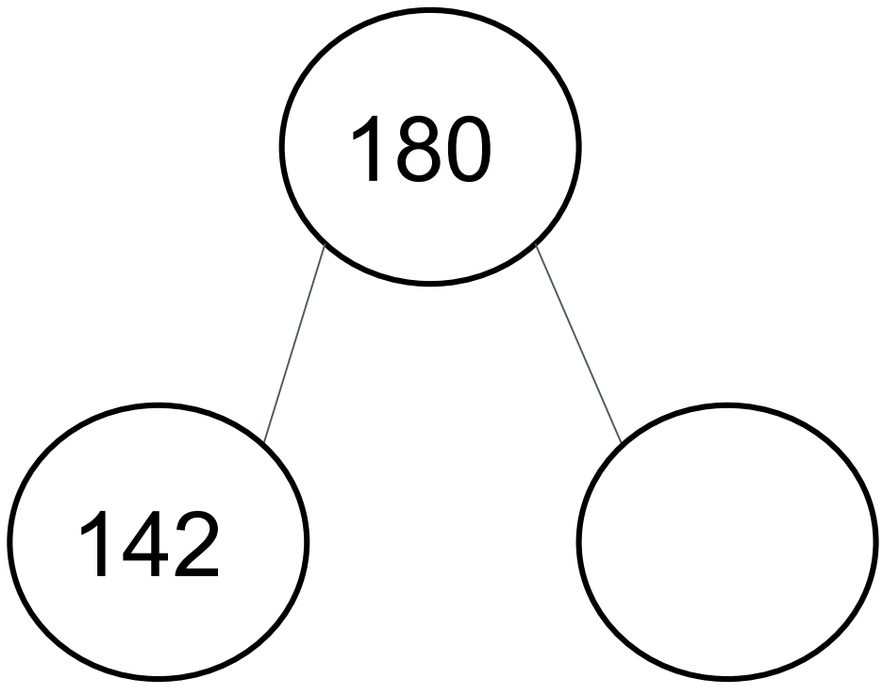

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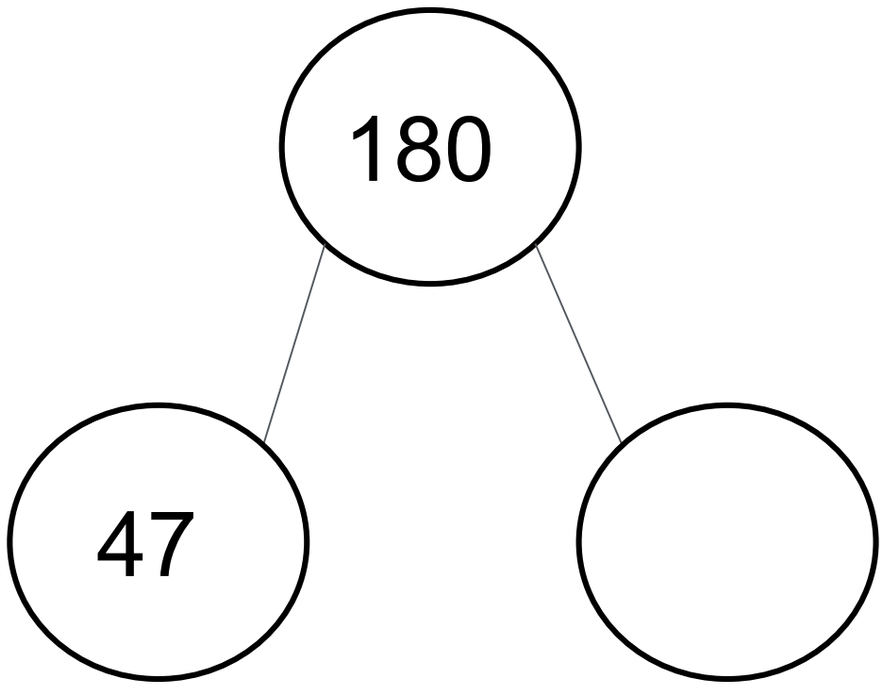

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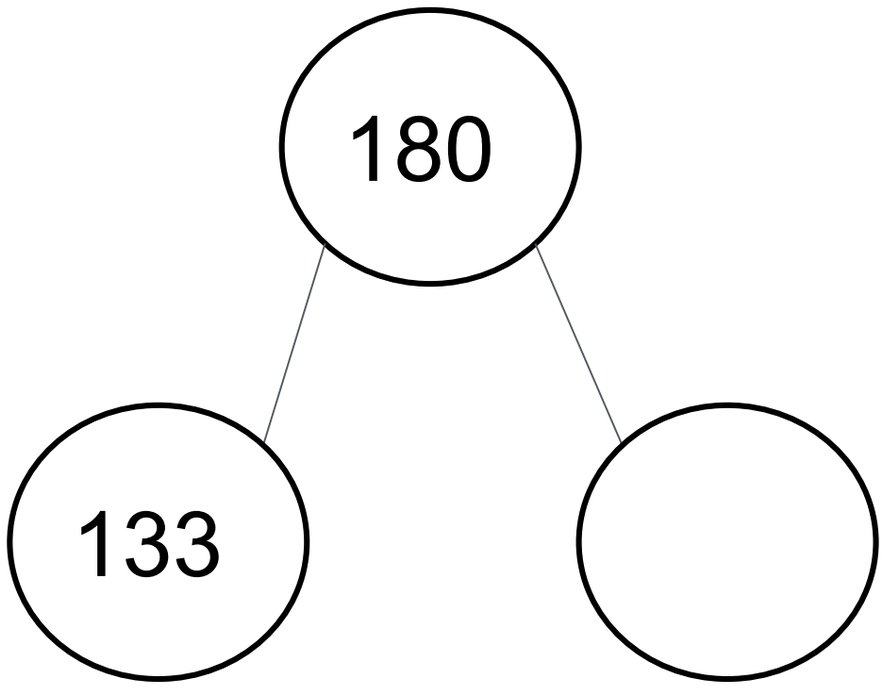

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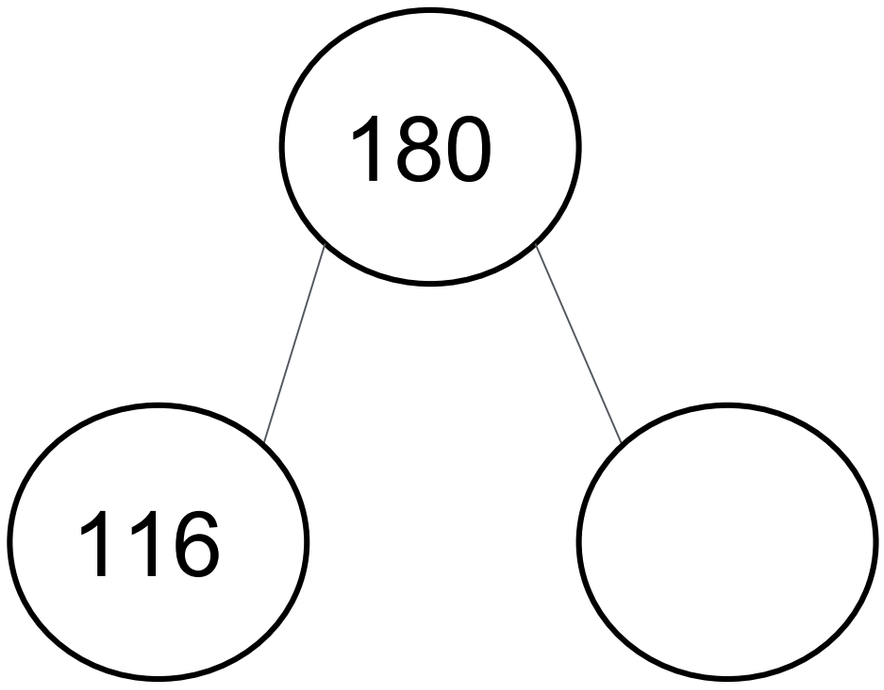

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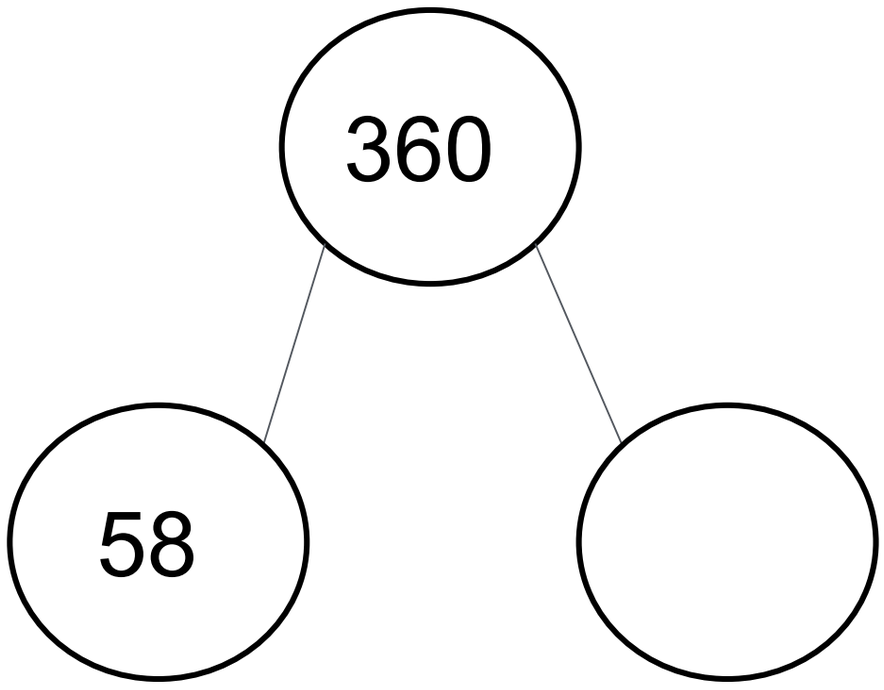

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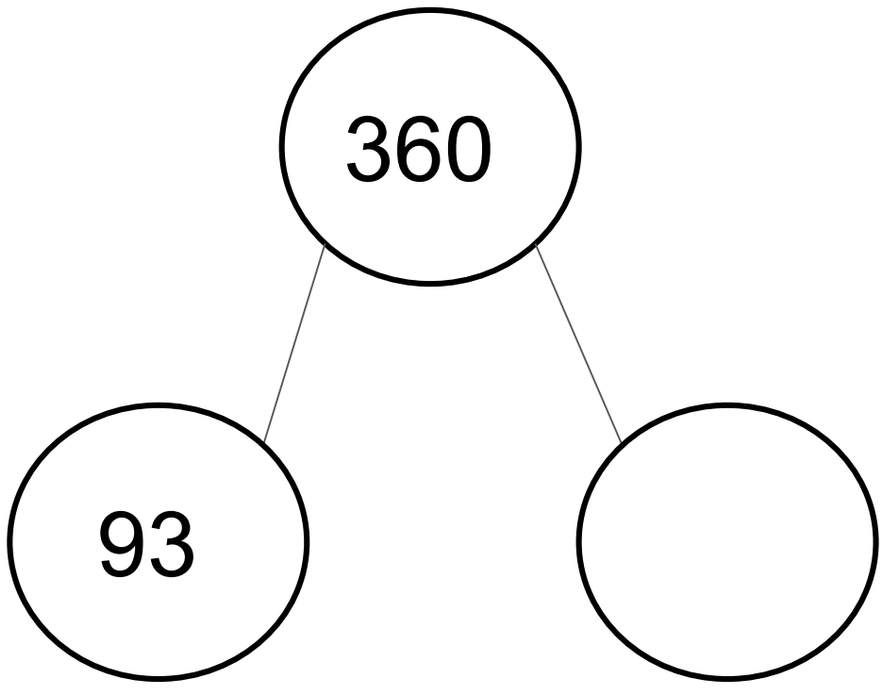

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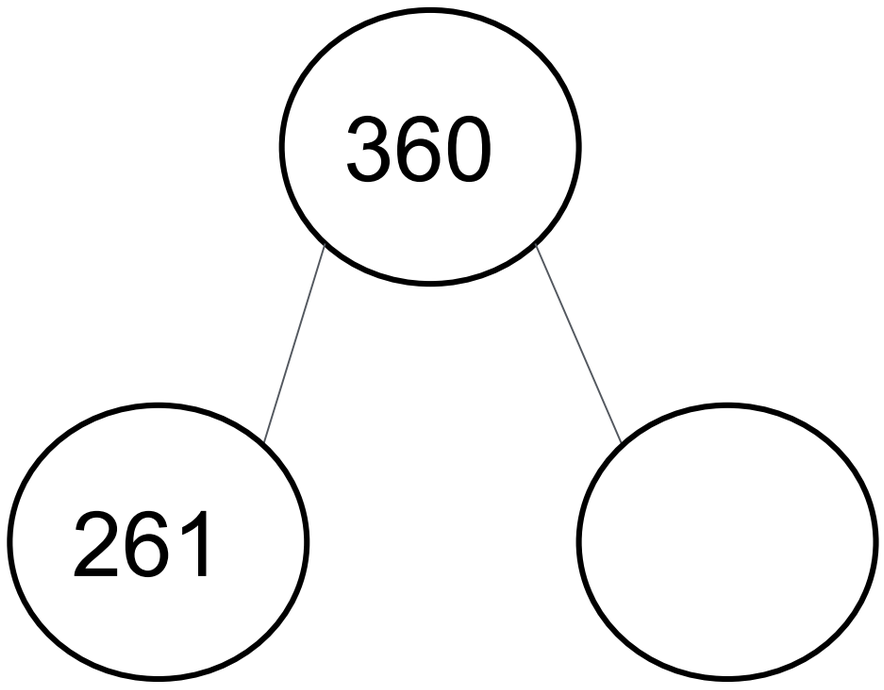

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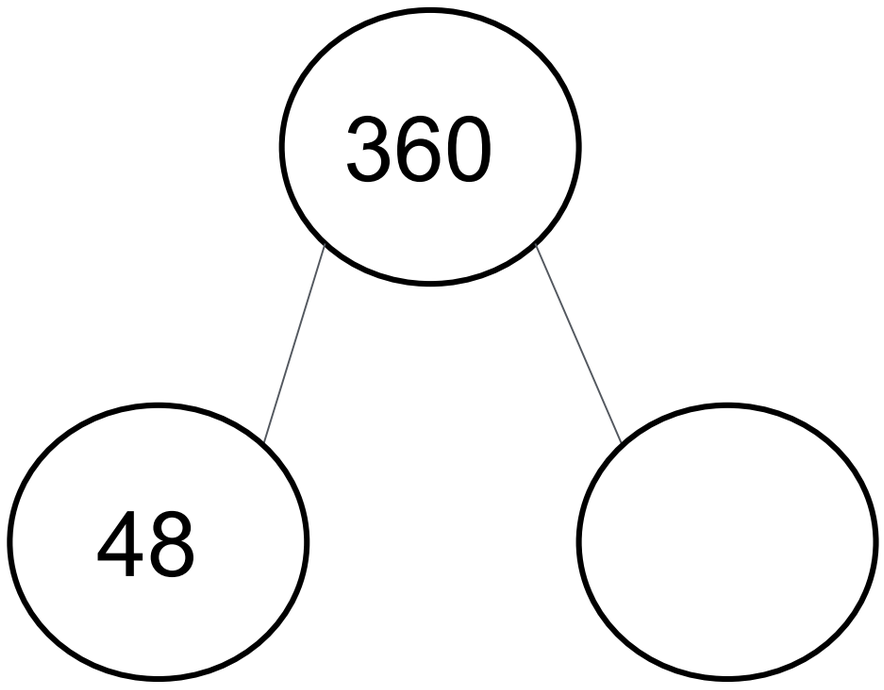
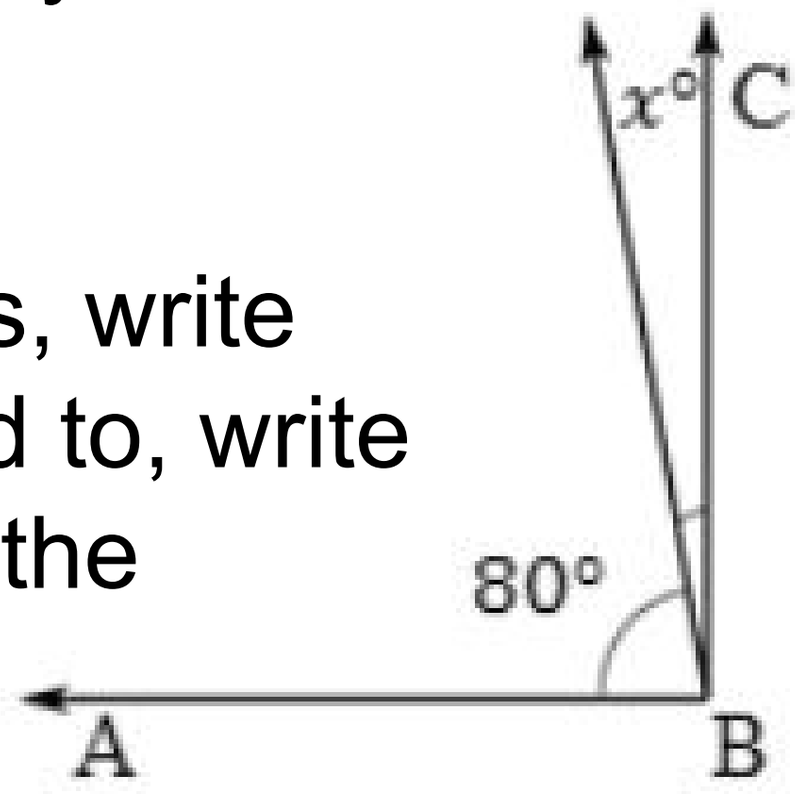


On your personal white boards, write the number bond, filling in the unknown part.

Find the Unknown Angle

Angle ABC is a right angle. Say the given angle.



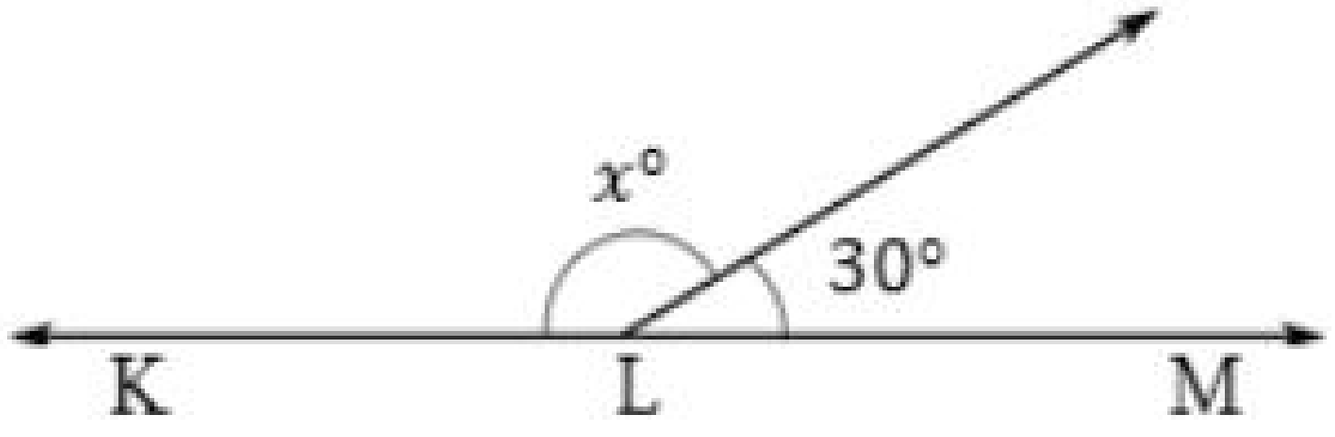
On your personal white boards, write the measure of $\angle x$. If you need to, write a subtraction sentence to find the answer.

Continue with right angles using the following possible sequence:
$x°$ = 30°, and $x°$ = 45°.

Find the Unknown Angle

KLM is a straight angle. What's the measurement of a straight angle?

On your boards, write the measure of $\angle xx$. If you need to, write a subtraction sentence to find the answer.



Continue with straight angles using the following possible sequence: $xx°$ = 60°, $xx°$ = 90°, and $xx°$ = 135°

Application Problem

Use patterns blocks of various types to create a design in which you can see a decomposition of 360°. Which shapes did you use? Compare your representation to that of your partner. Are they the same? Write an equation to show how you composed 360°. Refer to the pattern block chart to help with the angle measures of the pattern blocks, as needed.

Concept Development

Materials

Blank paper, personal white board, protractor, pattern blocks, straightedge, red and blue pencils, markers, or crayons

Find Unknown Angles

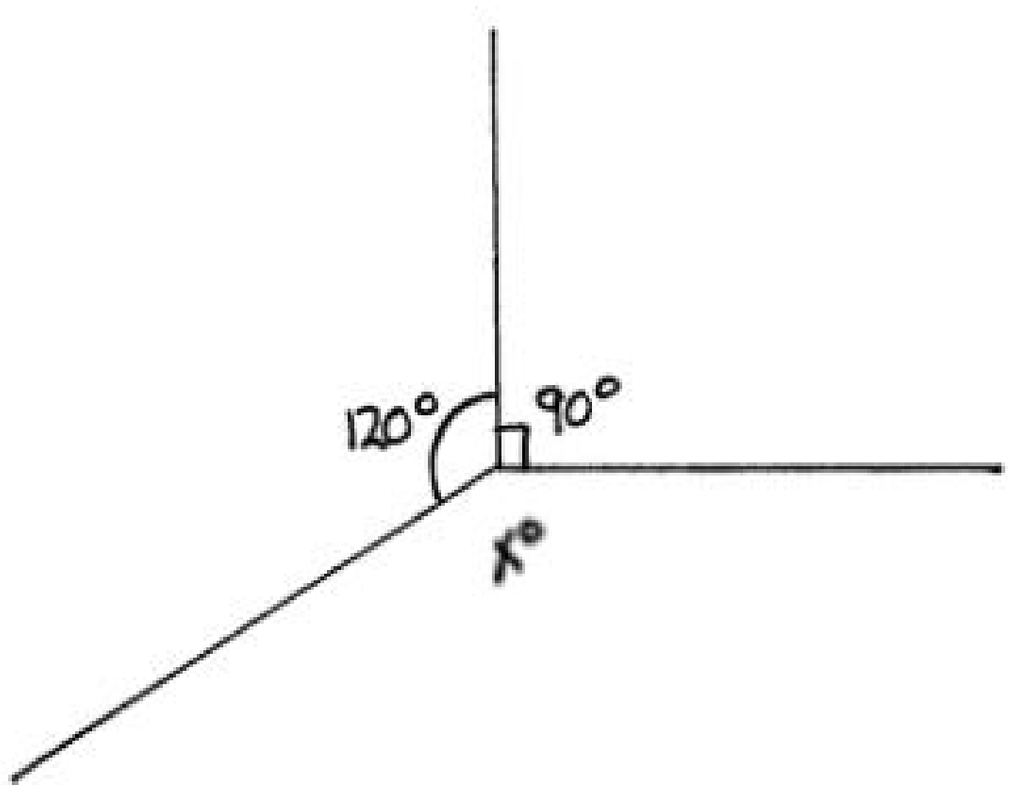
Take one of your pattern blocks away from the shape that you made in the Application Problem. Now, there is a missing piece.

Write an equation to show the total using x to represent the measurement of the angle of the missing piece.

Challenge your partner to determine the unknown angle. How can we solve?

Find Unknown Angles

How can we solve for the unknown angle?



Find Unknown Angles

Now, use your straightedge to draw two intersecting lines.

Locate where they intersect, and label that point Y.

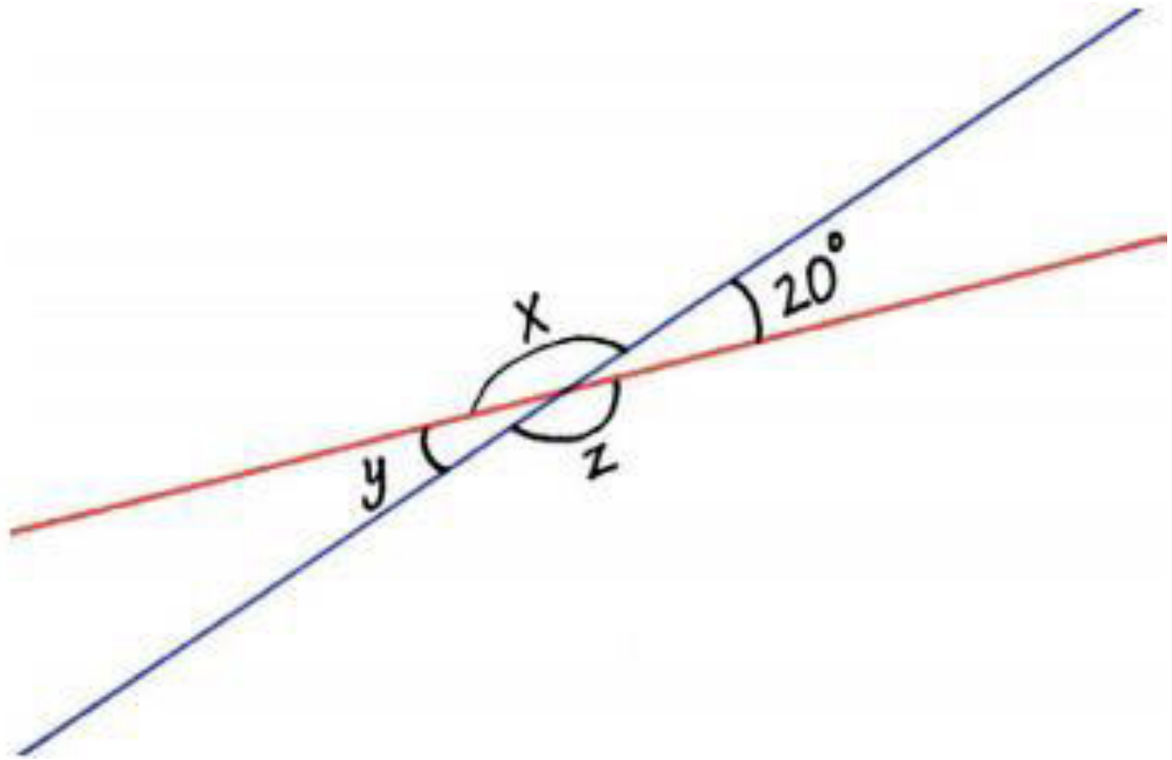
Measure each angle that composes the angle around point Y.

What do you notice?

Find Unknown Angles

What do you see?

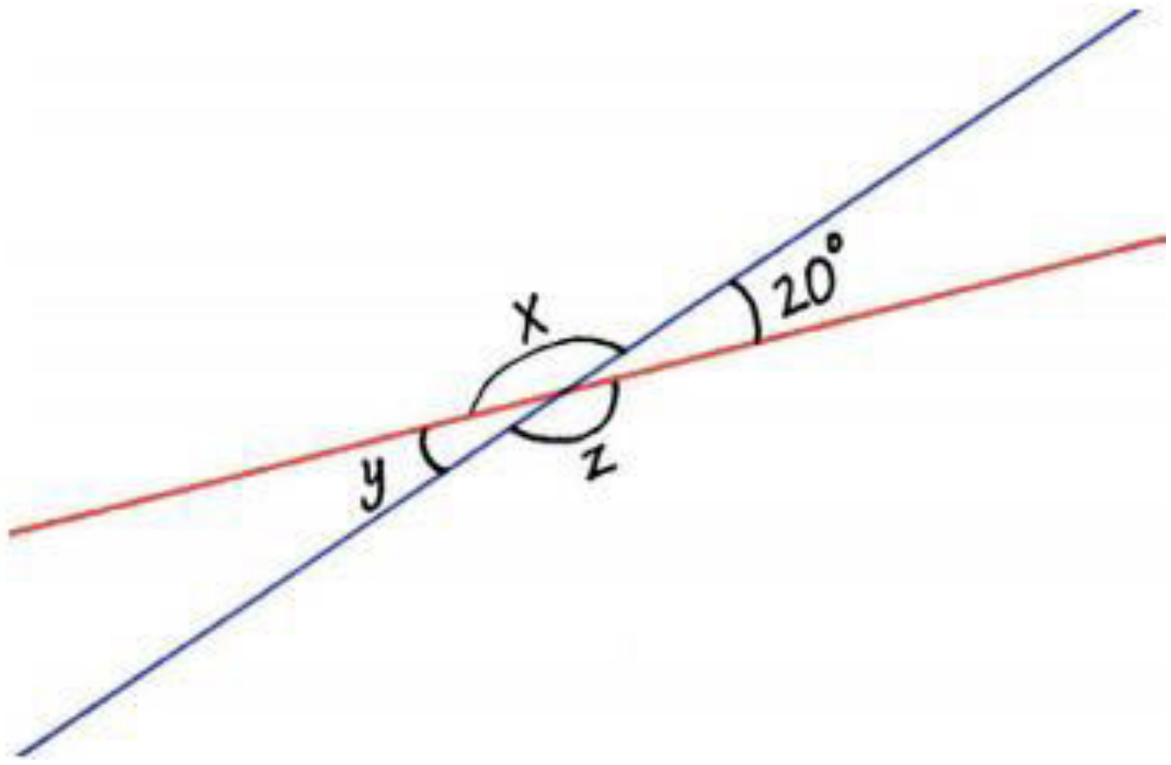
Determine the unknown angle, $\angle x$.



Now, look at the blue line. Notice the measure of $\angle y$ is unknown. How can we solve for it?

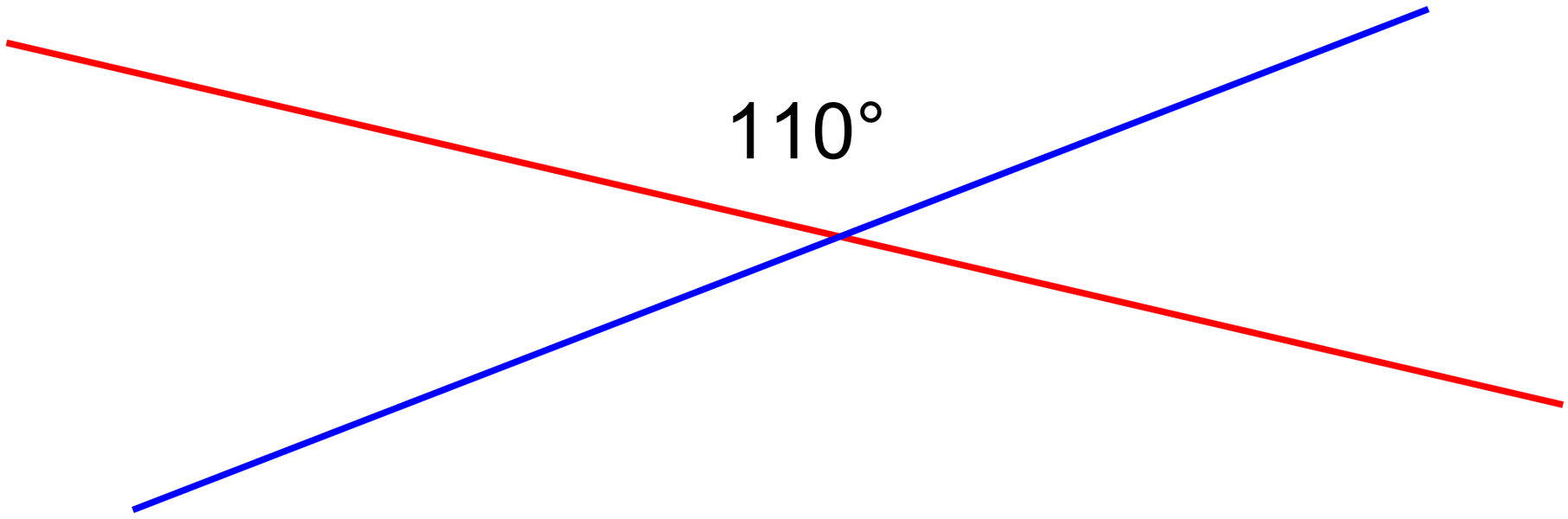
Find Unknown Angles

Let’s look at the red line again. How can we determine $\angle z$?



Find Unknown Angles

Let’s try another one. Show this on your personal white boards, and then work with a partner to determine the unknown angles.



Find Unknown Angles

Cyndi is making a quilt square. The blue, pink, and green pieces meet at a point. At the point, the blue piece has an angle measurement of 100°, and the pink has an angle measurement of 80°. What is the angle measurement determined by the green piece?

Find Unknown Angles

Draw a picture to show a representation of the quilt square.

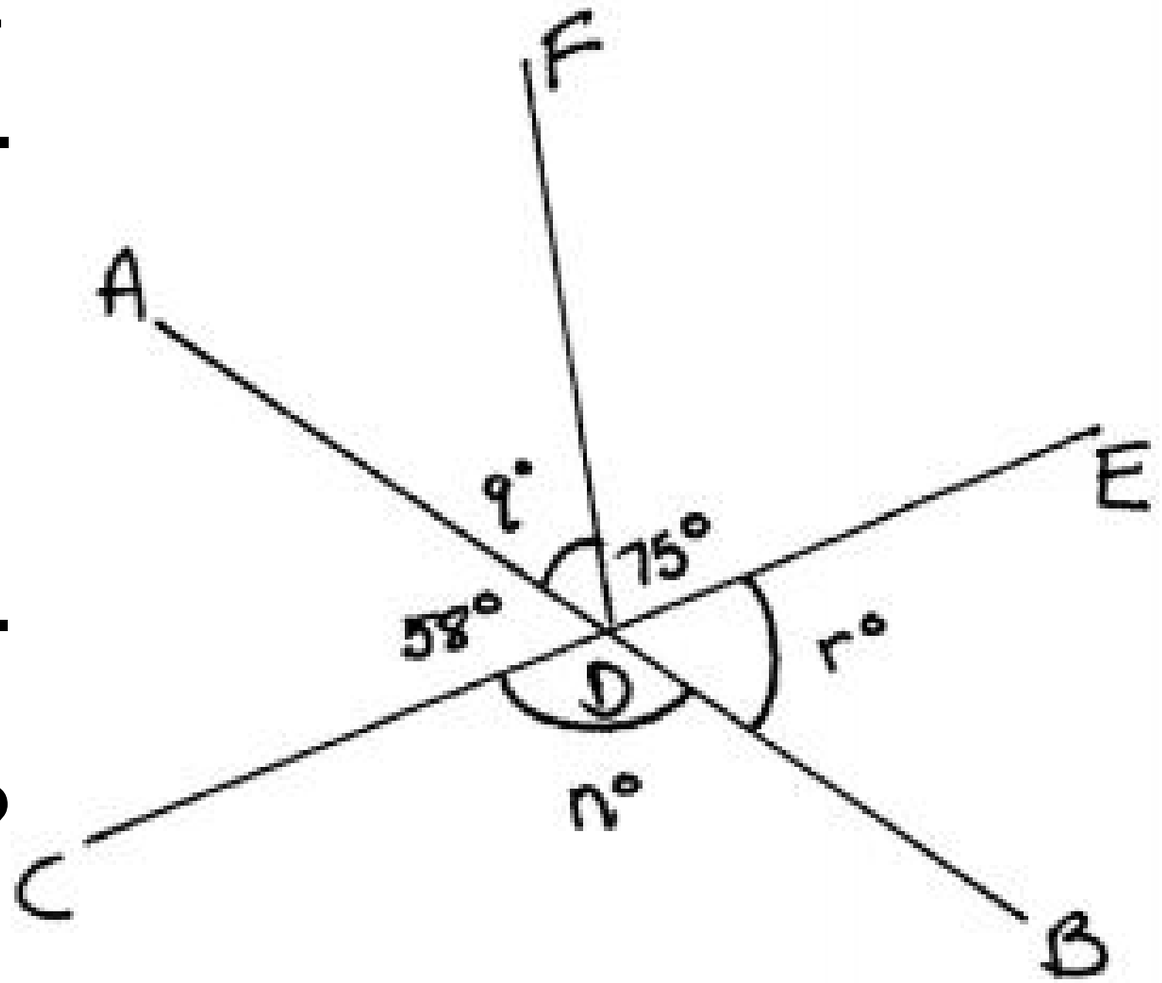
Tell your partner what your picture shows.

What do we want to know?

Write the equation that you will need to solve to find the measure of the last piece.

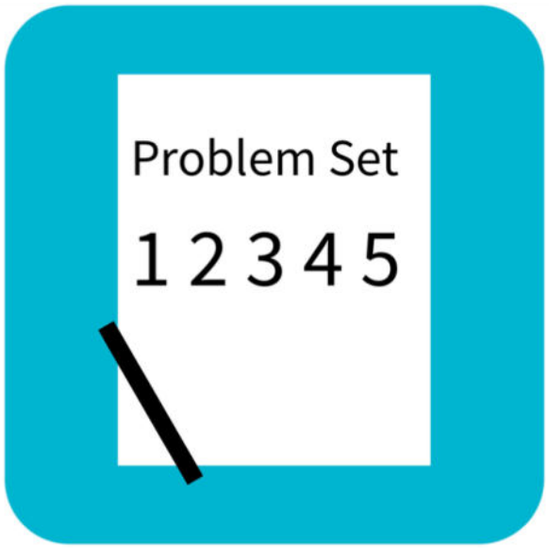
Find Unknown Angles

Line segments AB and CE are intersecting segments. Segment FD meets segment AB and CE at point D, which is the intersection of AB and CE.



What angles do we know?

Can we solve for the last angle?

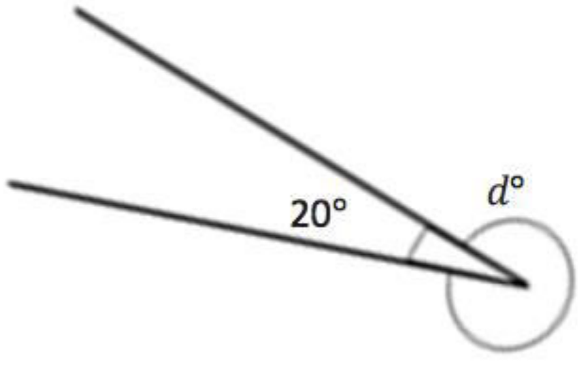


Problem Set

Name _____ Date _____

Write an equation, and solve for the unknown angle measurements numerically.

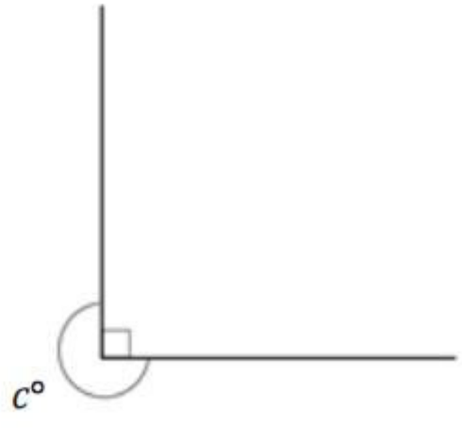
1.



_____° + 20° = 360°

$d°$ = _____°

2.



_____° + _____° = 360°

$c°$ = _____°

Debrief

Participate in the discussion by...

- Thinking about the question.
- Sharing your work.
- Explaining your strategy.
- Listening to others.

Debrief

- What prior knowledge did you need in order to determine the two unknown angles for Problem 3?
- For Problem 4, how did knowing the angle measure of a neighboring or touching angle assist you in solving for the unknown angles? Try using the term **adjacent angle** to describe the neighboring or touching angle.
- How does your knowledge of a line assist you in solving Problem 5?
- Describe how you used the lines to solve Problem 6. Did your method for solving involve adding up angles to 180° or 360° or a combination?

Exit Ticket

Name _____ Date _____

Write equations using variables to represent the unknown angle measurements. Find the unknown angle measurements numerically.