Eureka Math

4th Grade
Module 4
Lesson 10

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.

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Reflecting your Teaching Style and Learning Needs of Your Students

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- ➢ The view now looks like Screen B.
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- ➢ Choose MAKE A COPY and rename your presentation.
- ➢ Google Slides will open your renamed presentation.
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Screen A

"pop-out"

ReadyGEN™ in Action

3rd Grade
Unit 3, Module A
Lesson 1

Screen B

Gr3(2) U3MAL1 Sample Lesson.pptx

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EN™ in Action

rd Grade
Unit 3, Module A
Lesson 1

Icons

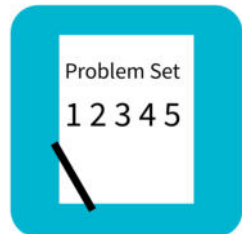| Icon	Label
RDW	Read, Draw, Write
(target)	Learning Target
(white board)	Personal White Board
Problem Set 1 2 3 4 5	Problem Set
(manipulatives)	Manipulatives Needed
+ − × ÷	Fluency
(speech bubbles)	Think Pair Share
(people)	Whole Class
(person)	Individual
(two people)	Partner
(three people)	Small Group
(clock)	Small Group Time

Lesson 10
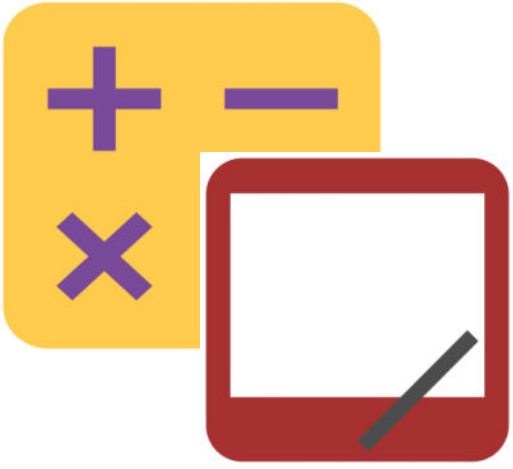
Objective: Use the addition of adjacent angle measures to solve problems using a symbol for the unknown angle measure.

Suggested Lesson Structure
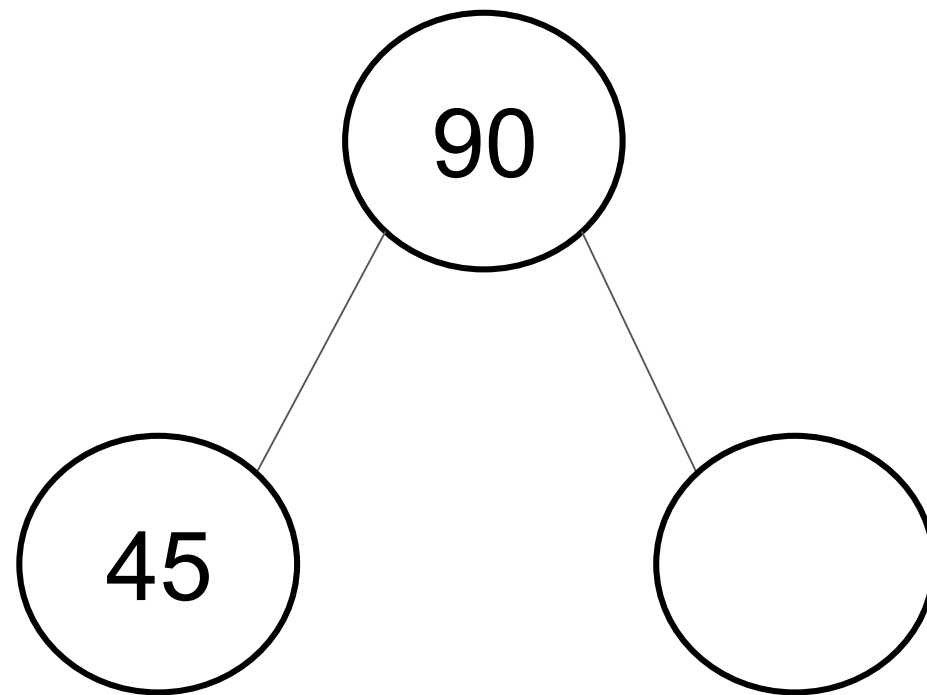
■	Fluency Practice	(12 minutes)
■	Application Problem	(8 minutes)
■	Concept Development	(30 minutes)
■	Student Debrief	(10 minutes)
	Total Time	**(60 minutes)**
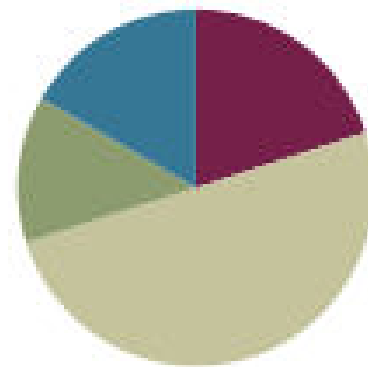
Objective: Use the addition of adjacent angle measures to solve problems using a symbol for the unknown angle measure.

Count by 90°

Count forward and backward, occasionally changing the direction of the count. Count by:
- Nines to 36
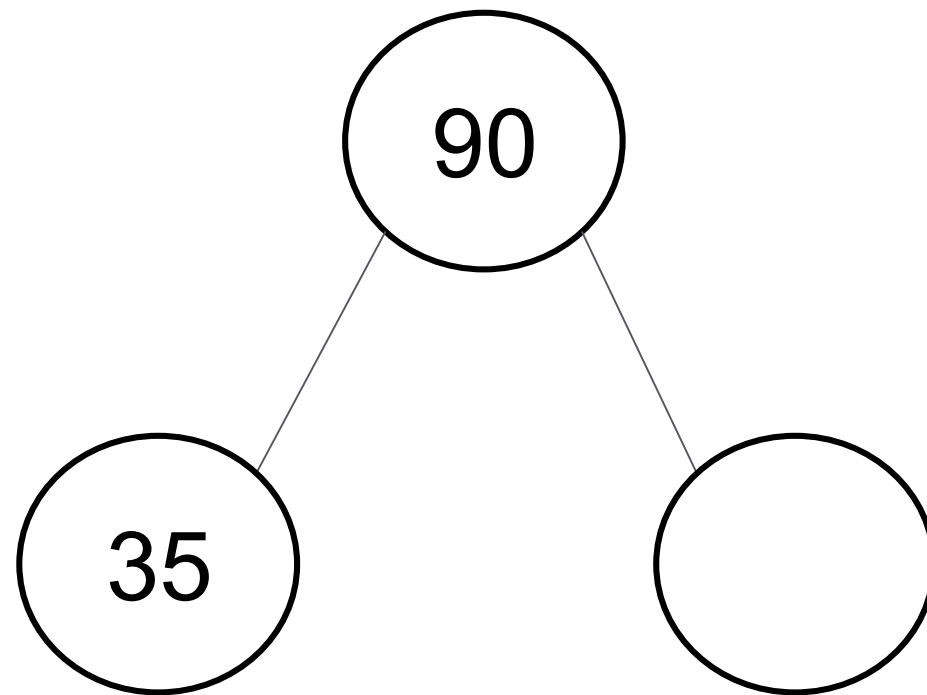- 9 tens to 36 tens
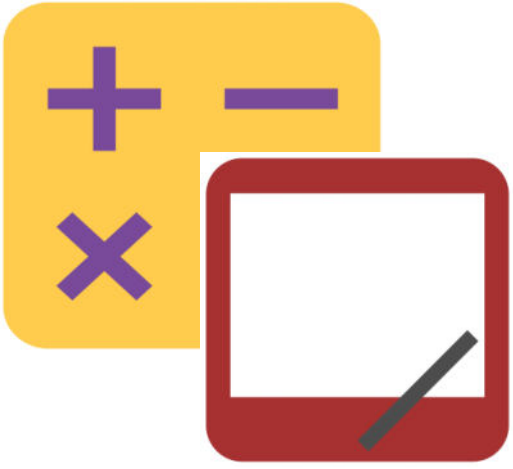- 90 to 360
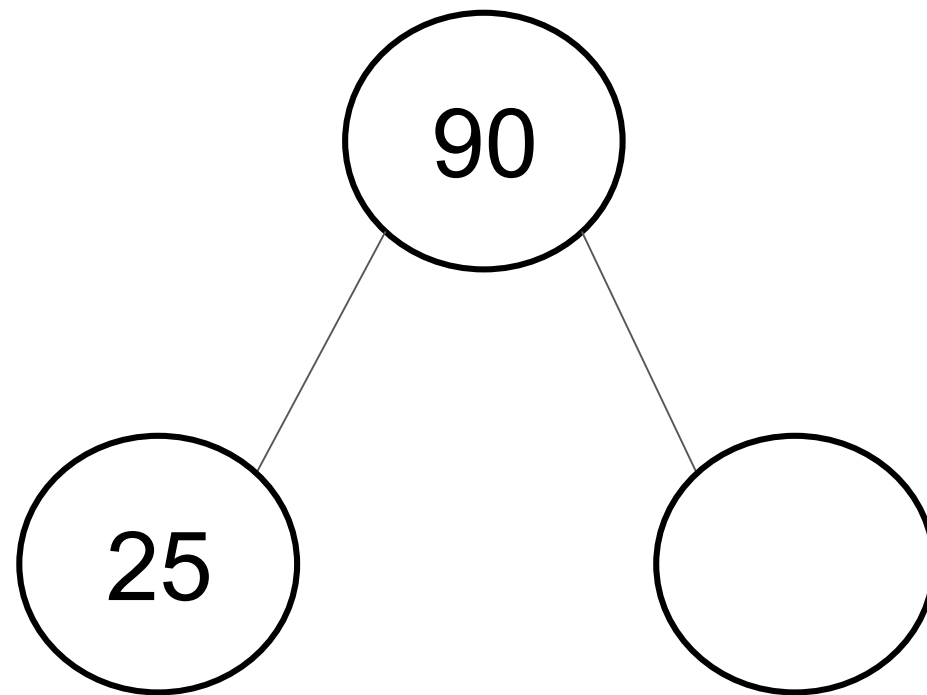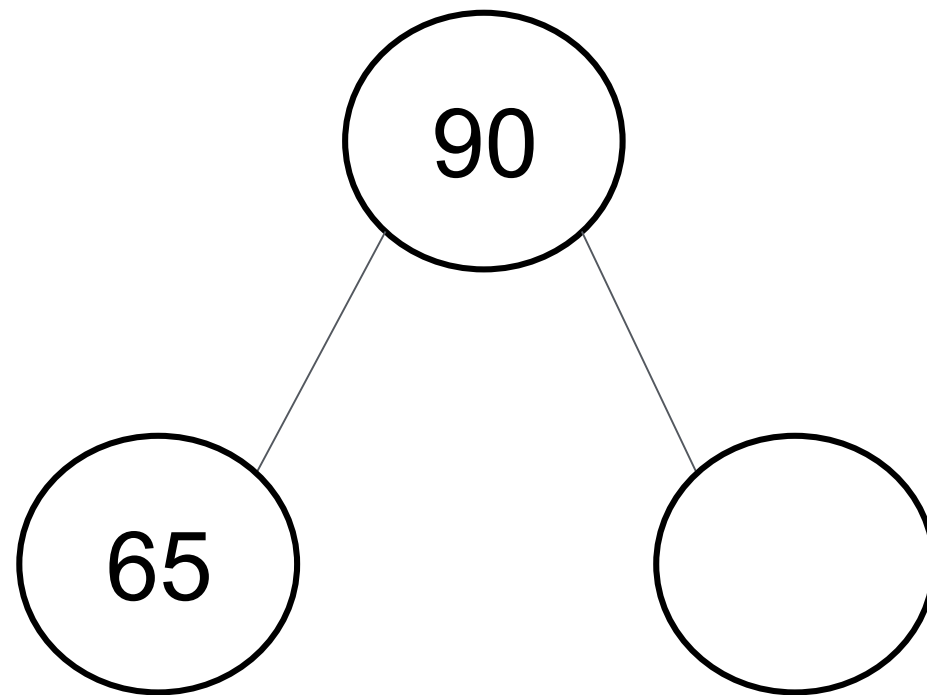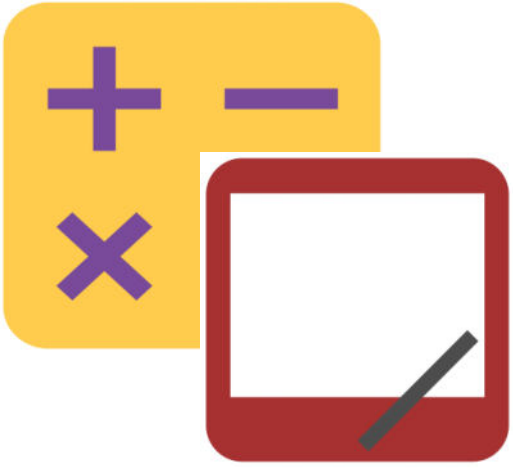- 90° to 360° (while turning)

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

```
        ( 90 )
       /      \
   ( 35 )    (    )
```
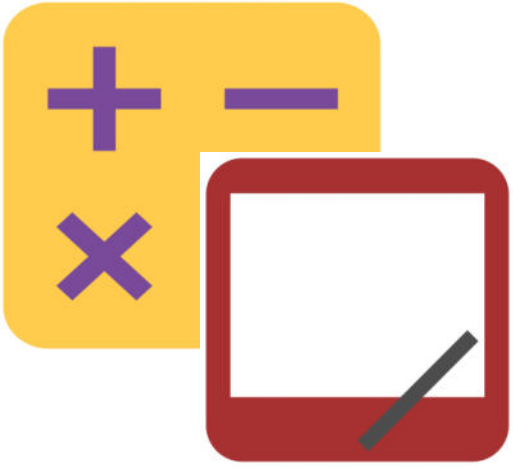
On your personal white boards, write the number bond, filling in the unknown part.
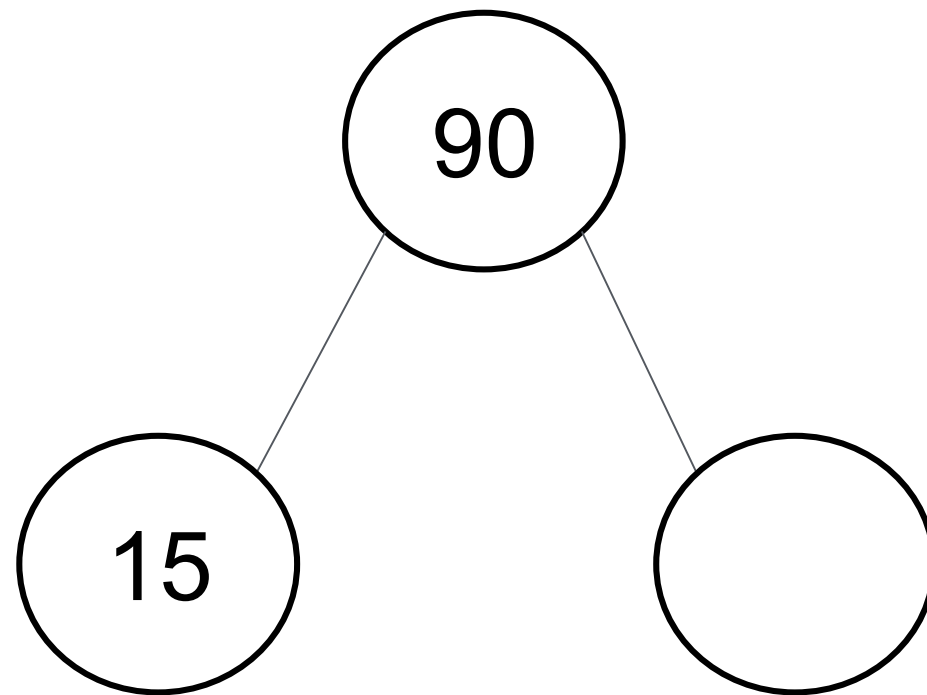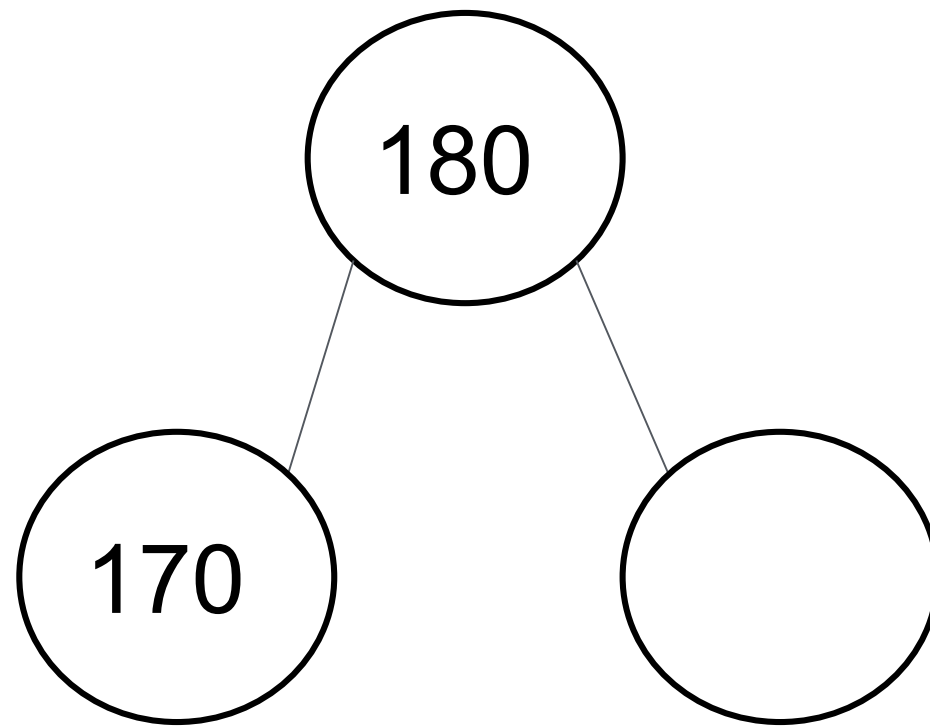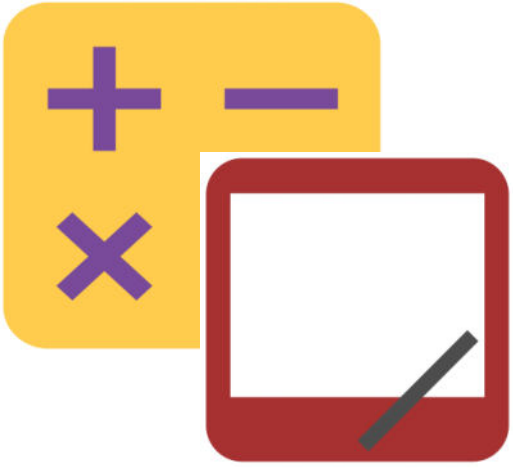
Break Apart 90, 180, and 360

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

Break Apart 90, 180, and 360

```
        ( 90 )
        /      \
    ( 65 )    (   )
```
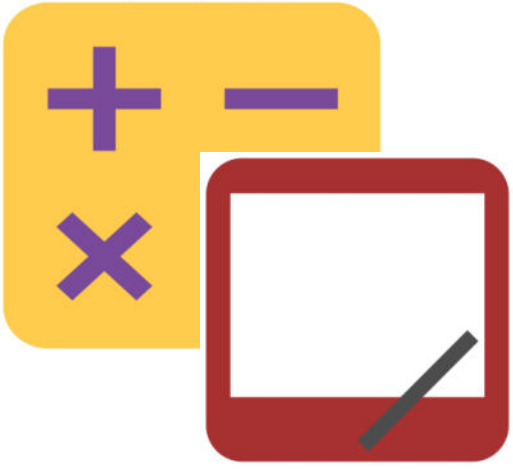
On your personal white boards, write the number bond, filling in the unknown part.
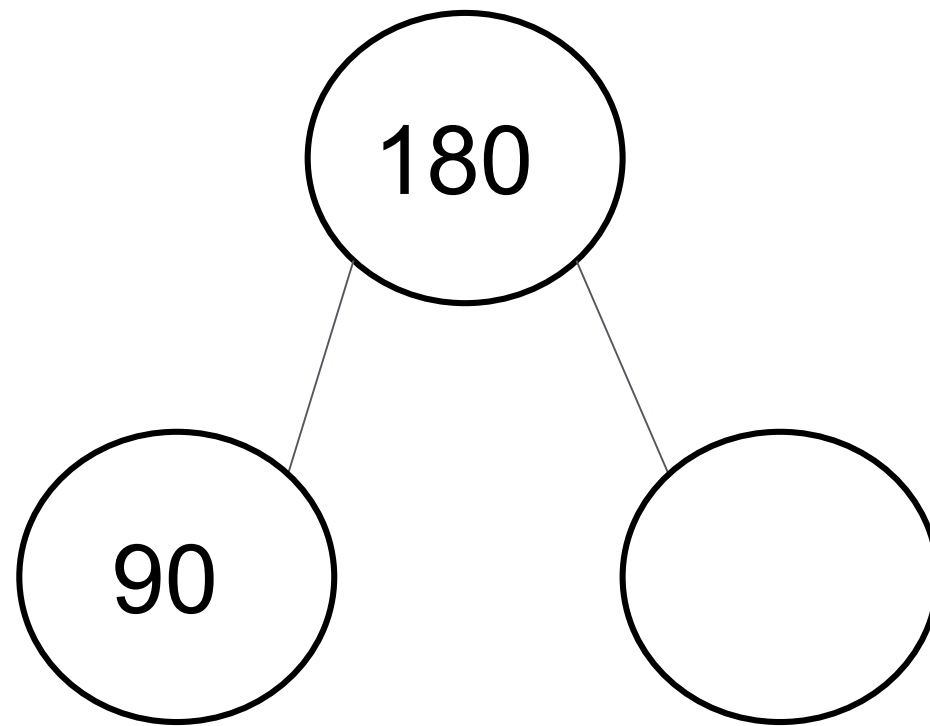
Break Apart 90, 180, and 360

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

Break Apart 90, 180, and 360

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

Break Apart 90, 180, and 360

```
        ┌───────┐
        │  180  │
        └───┬───┘
         ╱     ╲
    ┌────┐     ┌────┐
    │ 90 │     │    │
    └────┘     └────┘
```
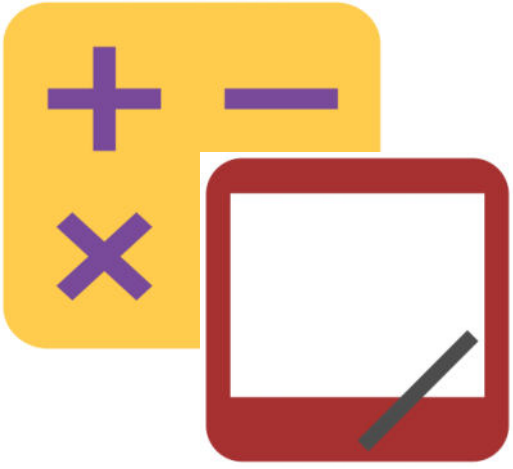
On your personal white boards, write the number bond, filling in the unknown part.
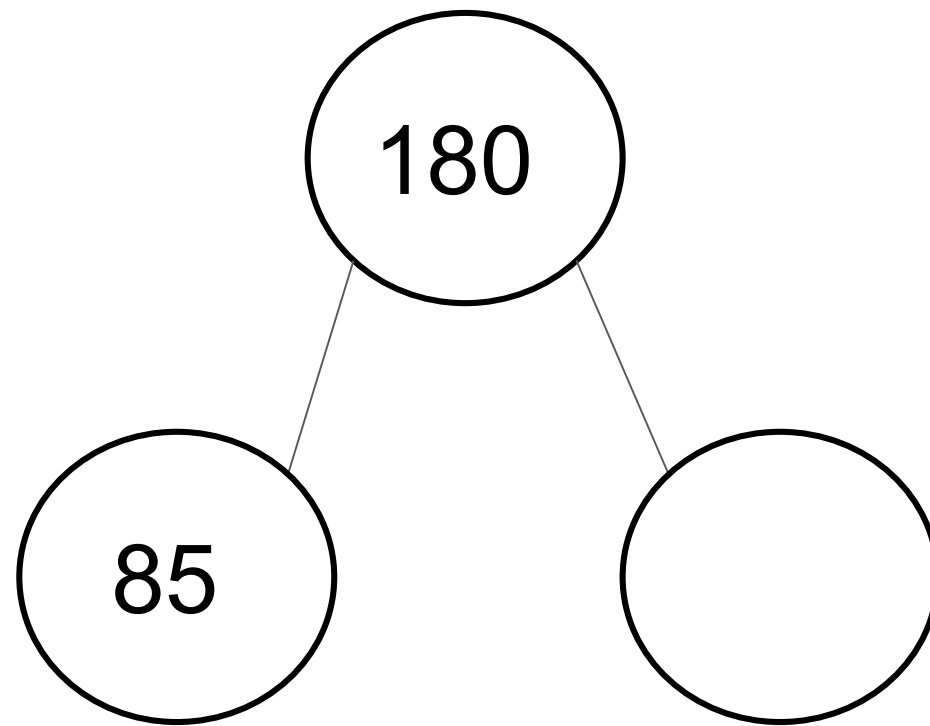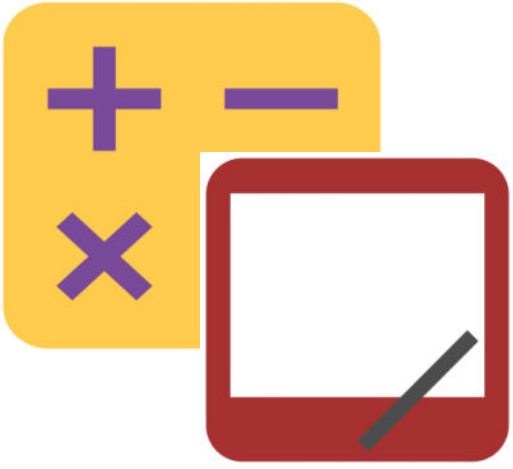
Break Apart 90, 180, and 360

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

Break Apart 90, 180, and 360

180

125

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

Break Apart 90, 180, and 360

On your personal white boards, write the number bond, filling in the unknown part.
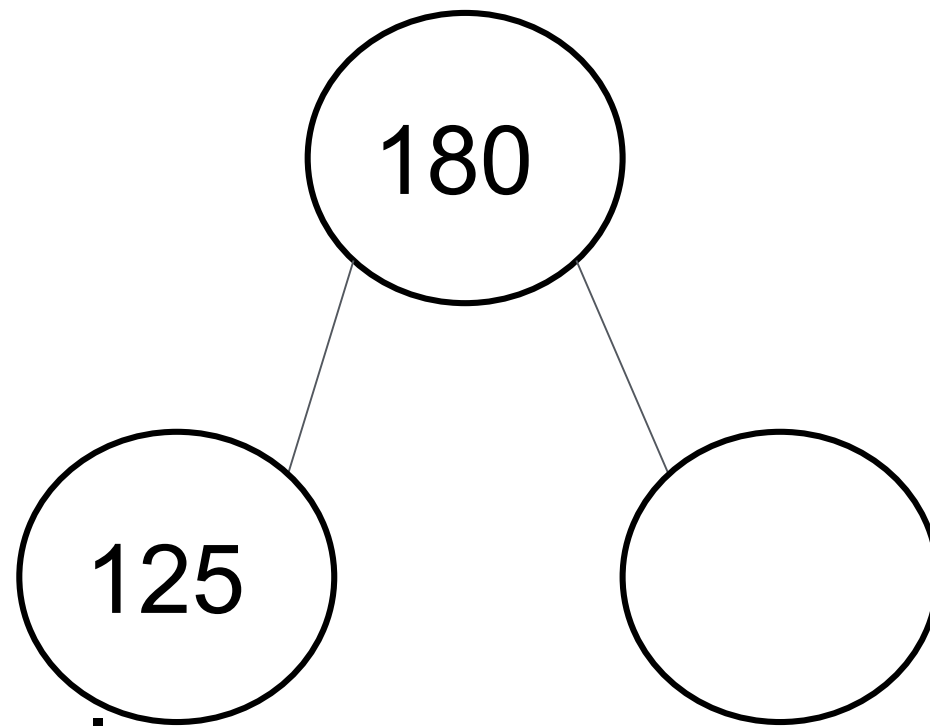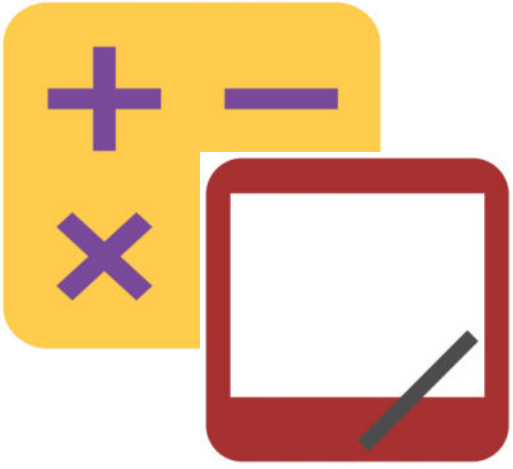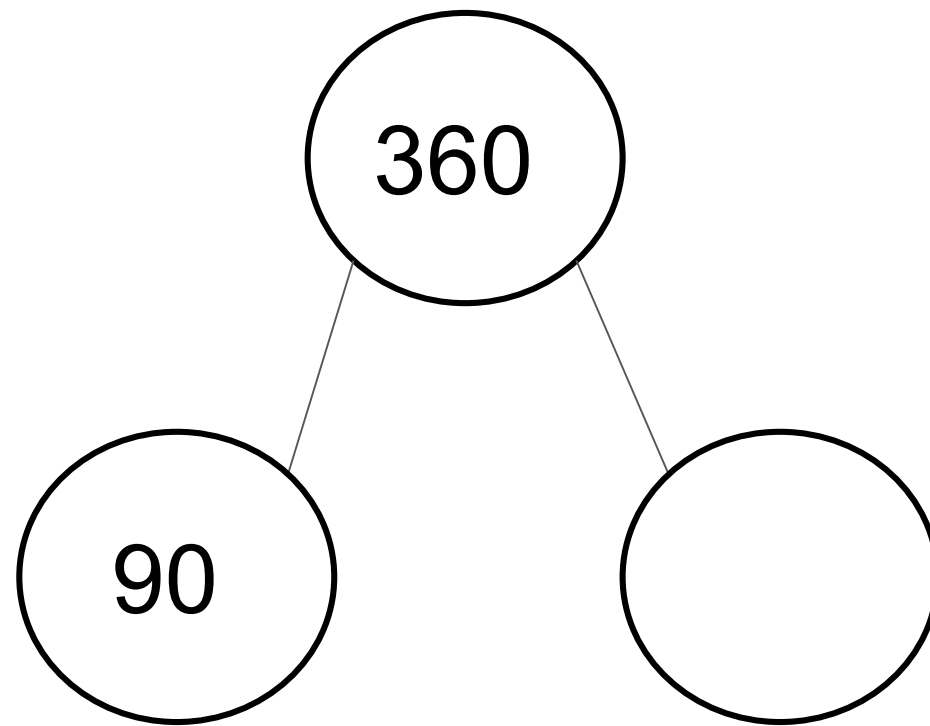
Break Apart 90, 180, and 360

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

Break Apart 90, 180, and 360

360

270

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

Break Apart 90, 180, and 360

```
        ( 360 )
        /      \
   ( 240 )    (    )
```

On your personal white boards, write the number bond, filling in the unknown part.
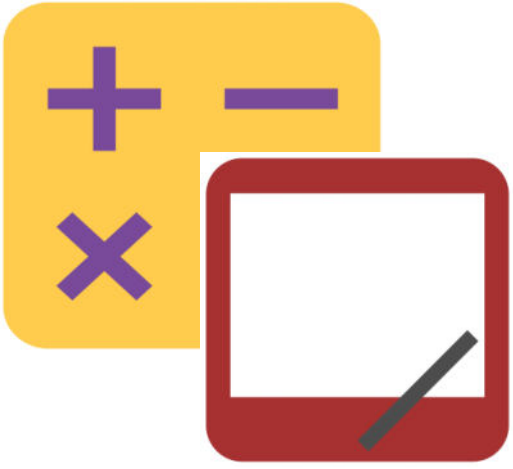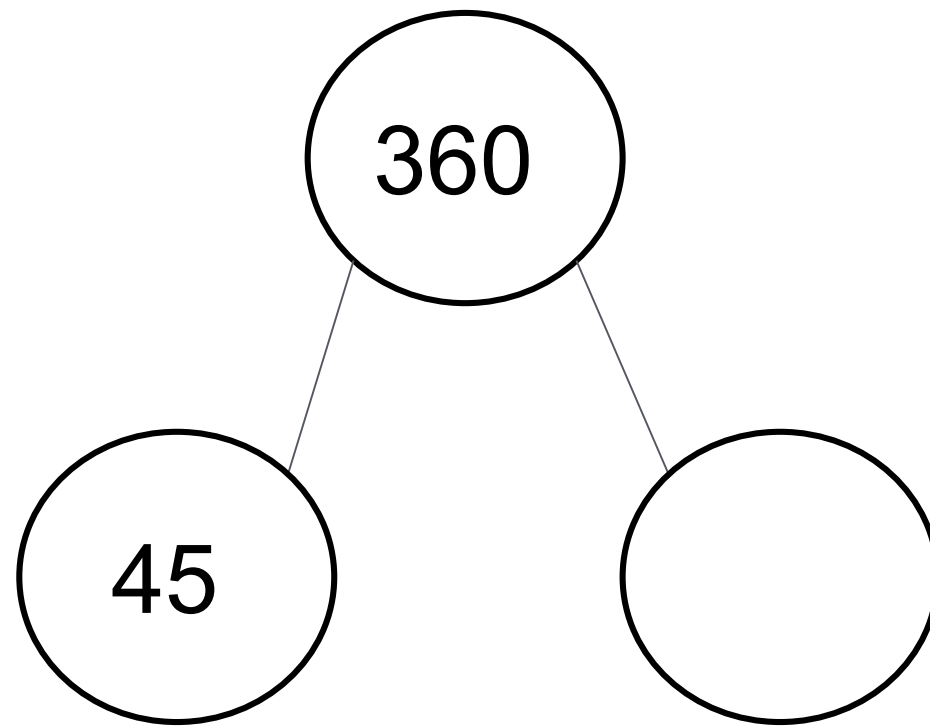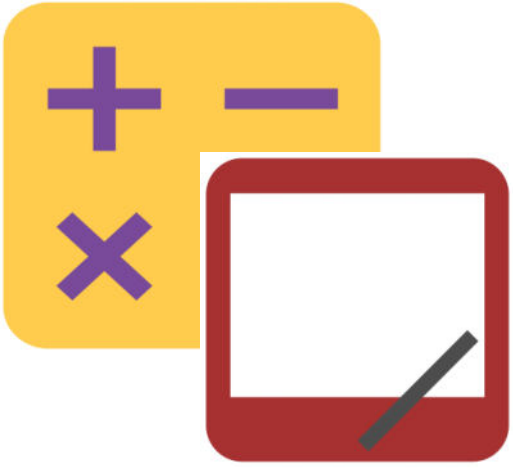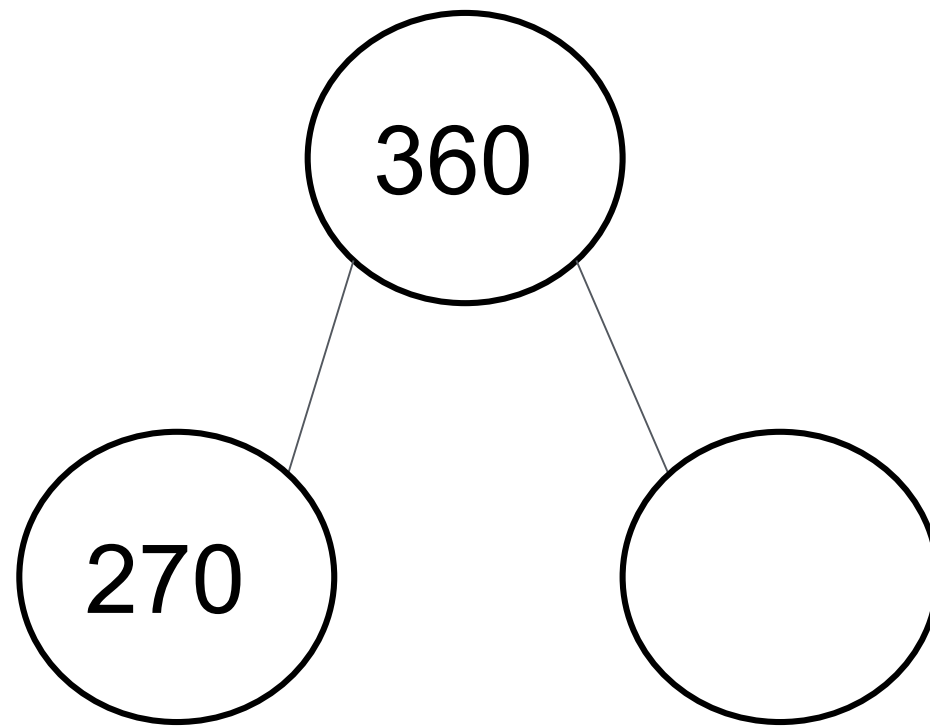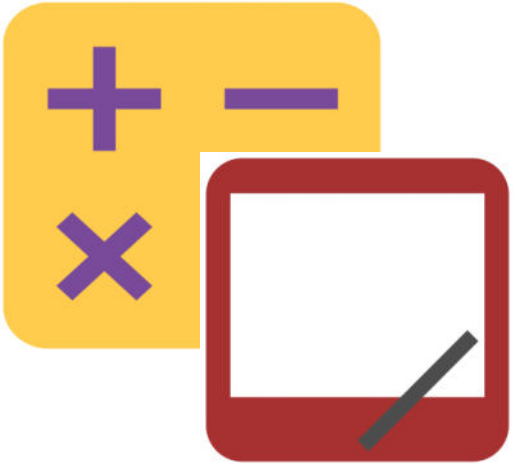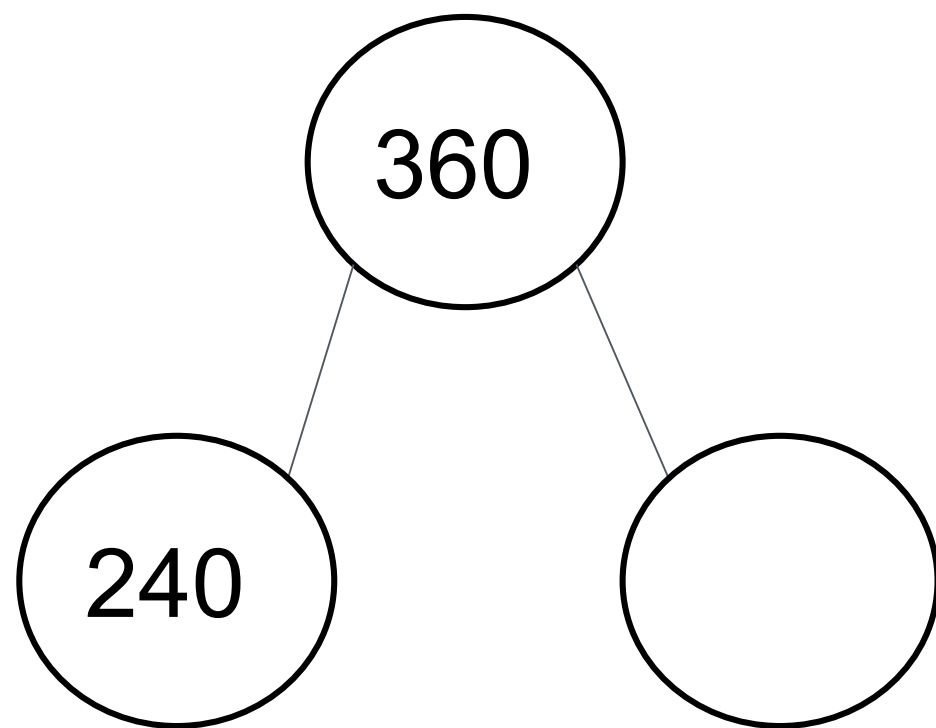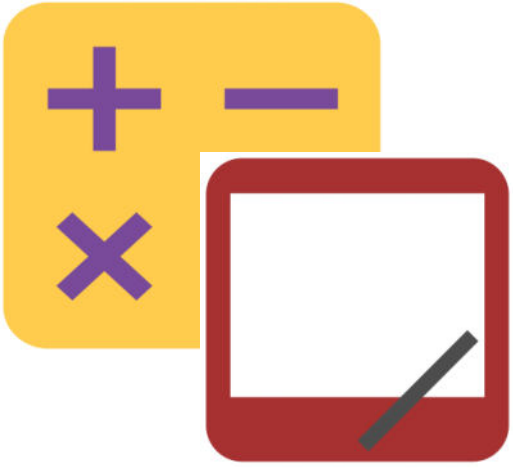
Break Apart 90, 180, and 360

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

Physiometry

Stand up.
Model a 90° angle with your arms.
Model a 180° angle with your arms.
Model a 270° angle.
Model a 360° angle.
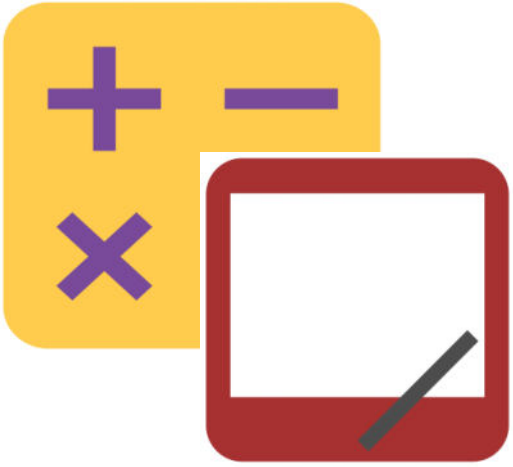
Physiometry

Point to the walls that run perpendicular to the back of the room.
Turn 90° to your left.
Turn 90° to your left.
Turn 90° to your left.
Turn 90° to your left.
Turn 270° to your right.
Turn 180° to your left

Application Problem

Using pattern blocks of the same shape or different shapes, construct a straight angle. Which shapes did you use? Compare your representation to that of your partner. Are they the same? Which pattern block can you add to your existing shape to create a 270° angle? How can you tell?

Concept Development

<u>Materials</u>

(T/S) Blank paper (full sheet of letter-size paper ripped into two pieces), personal white board, straightedge, protractor, pattern blocks

Angle Measures

Grab a blank sheet of ripped paper.

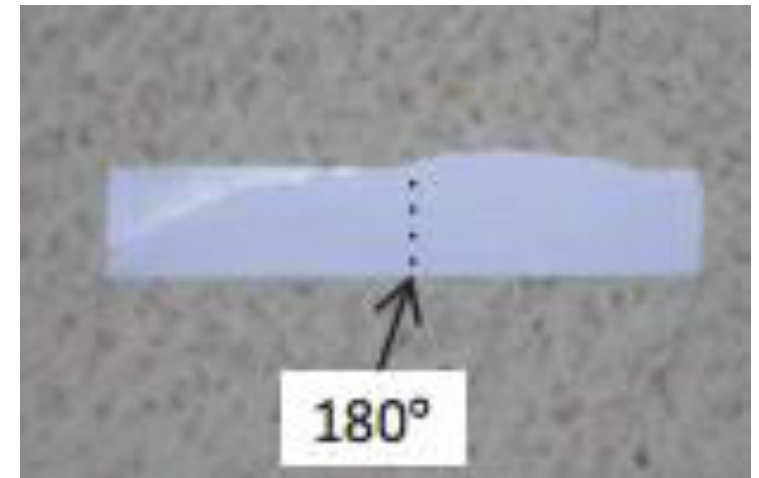Fold it in half from bottom to top.

Fold it from left to right.

180°

Open the paper back up one fold.

Run your finger along the line of the horizontal fold. Consider the fold. Mark the vertex with a dot.

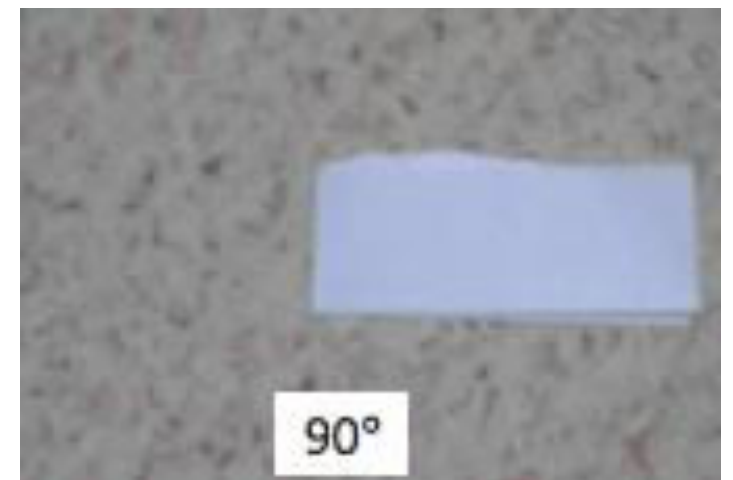What special angle have you created?

Angle Measures

Fold your paper back left to right. Be sure it is folded so that the previously folded edge is directly on top of itself.

Run your finger along the folded sides.

What angle have you created now, if the vertex of the angle is at the corner of the folds?

90°

Angle Measures

Fold the vertical side down to match up with the horizontal side, like this.

Unfold.

How many angles has the right angle been decomposed into?

What do you notice about the two angles?

Angle Measures

Discuss with your partner.

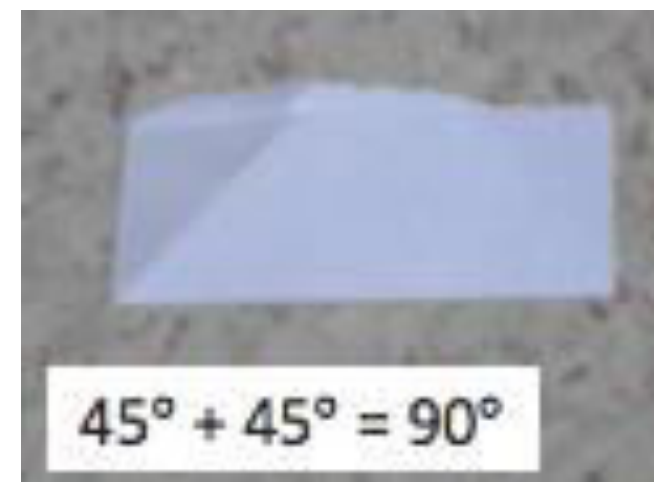How can you determine the measurement of each angle?

Angle Measures

Unfold your paper one fold.

Let's look at the angles. What do we see?

Say the number sentence that shows the total of the angle measurements.
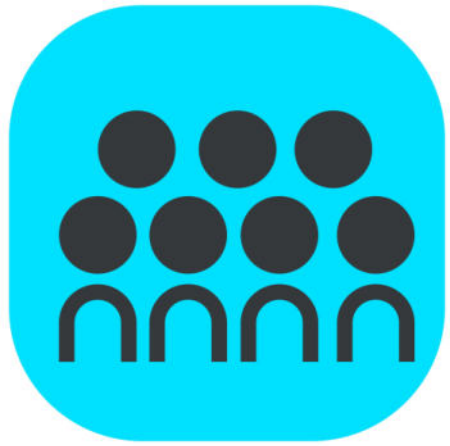
$$45° + 45° = 90°$$

Angle Measures

Unfold another fold. What do you see now?

What do you notice?

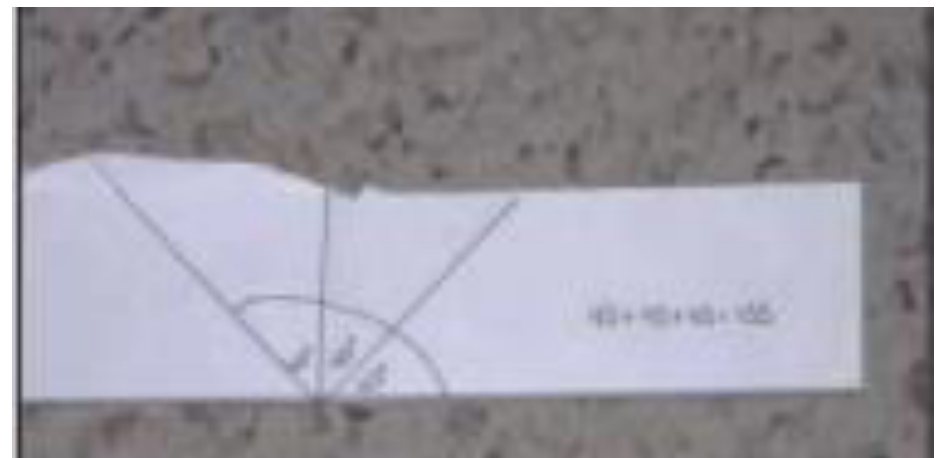Say the number sentence that shows the total of the angle measurements.

Angle Measures

What if we just looked at three of the angles?

Draw an arc on your paper to show the angle created by looking at three of the angles together.

Say the number sentence that shows the total of the angle measurements.
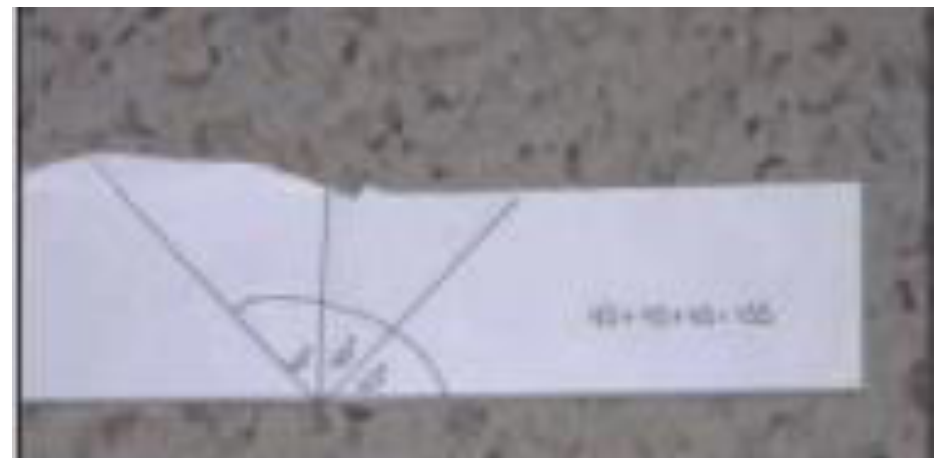
Angle Measures

Let's verify with a protractor.

Use your straightedge to trace along each crease.

Measure and label each angle measure, and then measure and label the entire angle.

Write the number sentence.

Angle Measures

Fold a different ripped piece of paper to form a 90° angle as we did before.

Fold the upper left-hand section of your paper down. This time, the corner should not meet the bottom of your paper.

Angle Measures

Follow these directions:

1. Use a straightedge to draw a segment on the fold.

2. Measure the two angles with your protractor.

3. Label each angle measure.

4. Write the number sentence to show the sum of the two angles.
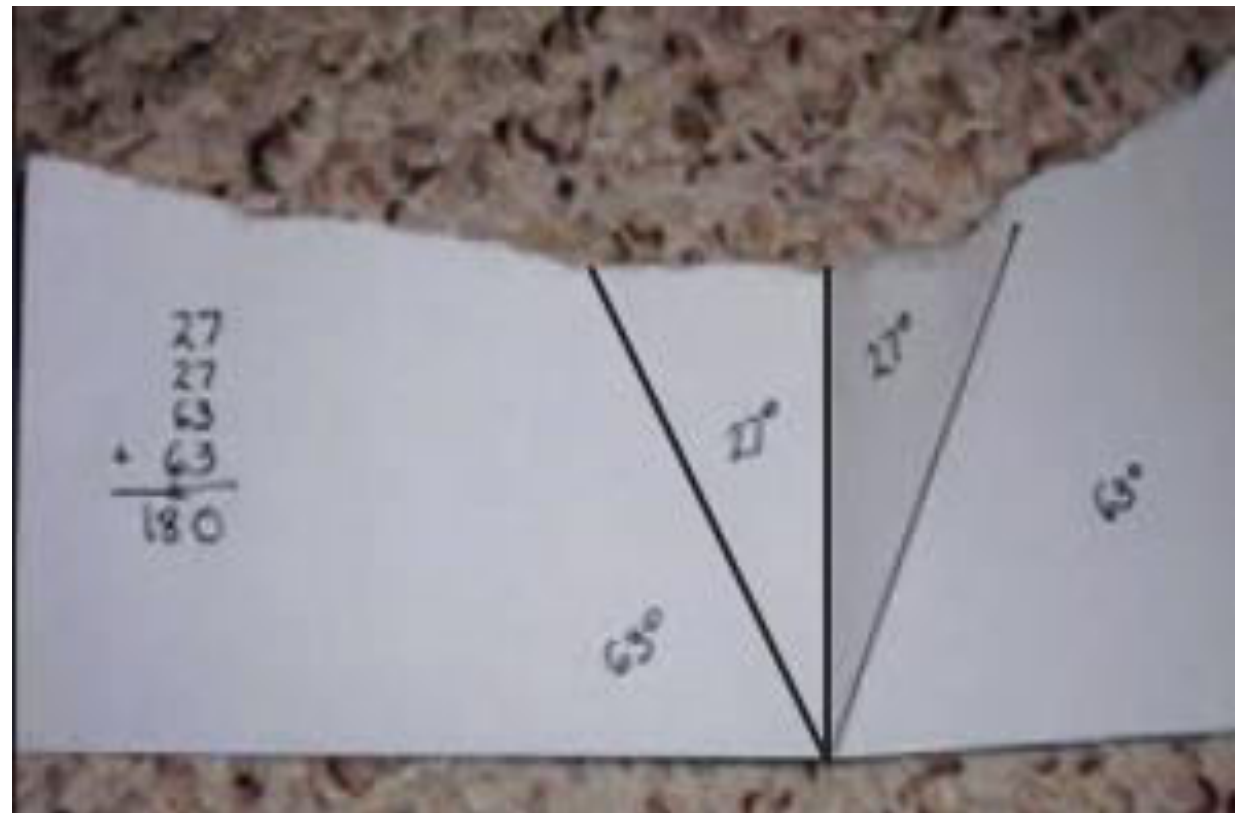
Angle Measures

Angle Measures

Unfold your paper another time. What do you see?

Repeat the same process with these four angles to find their sum. Do you need to measure all of the angles?
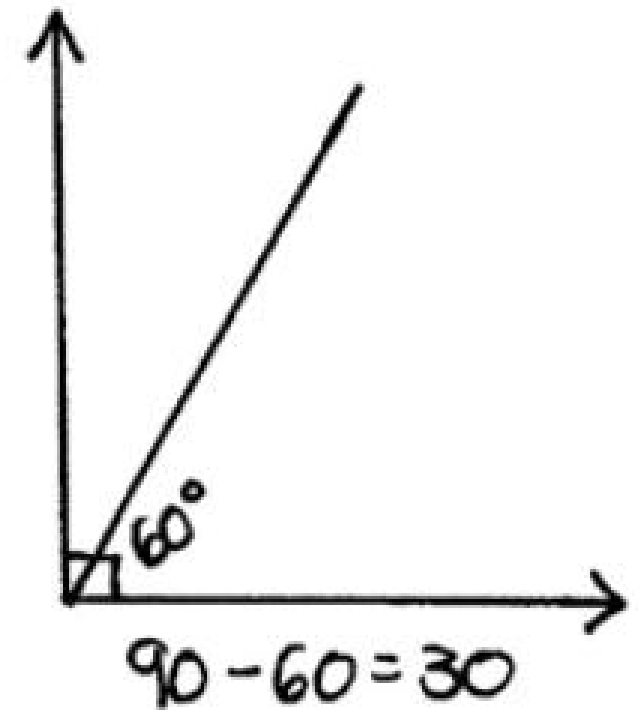
Angle Measures

Discuss with your partner how we can find the measurement of the unknown angle. Use what we just learned
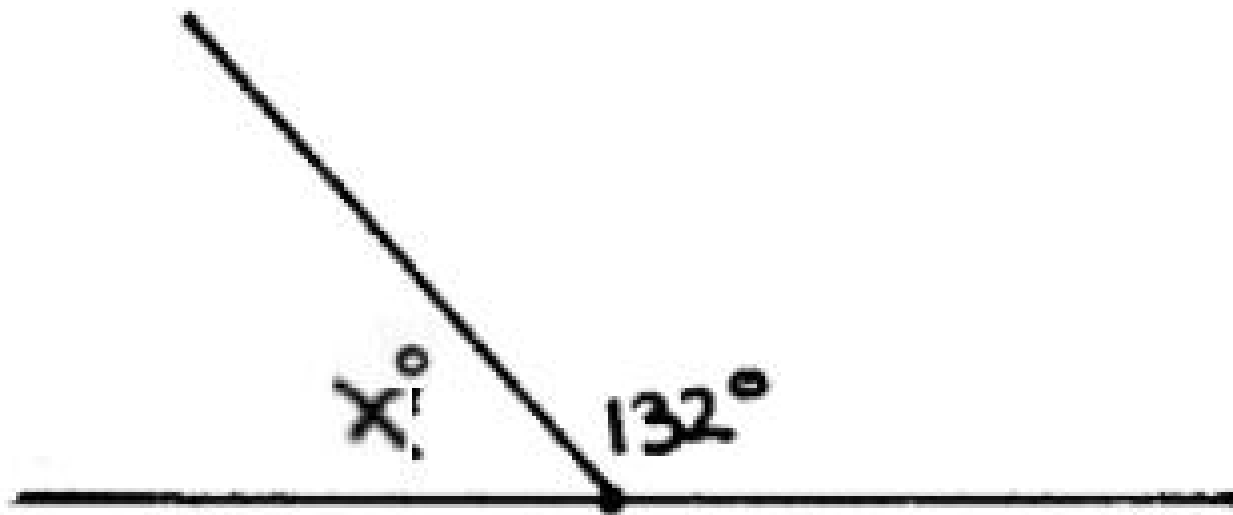
When we take a whole angle and break it into two parts, if we know the angle measurement of one part, we can find the angle measurement of the other part by subtracting.
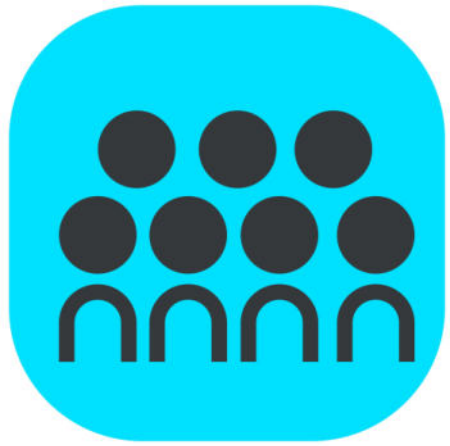
$$60°$$

$$90 - 60 = 30$$

Angle Measures

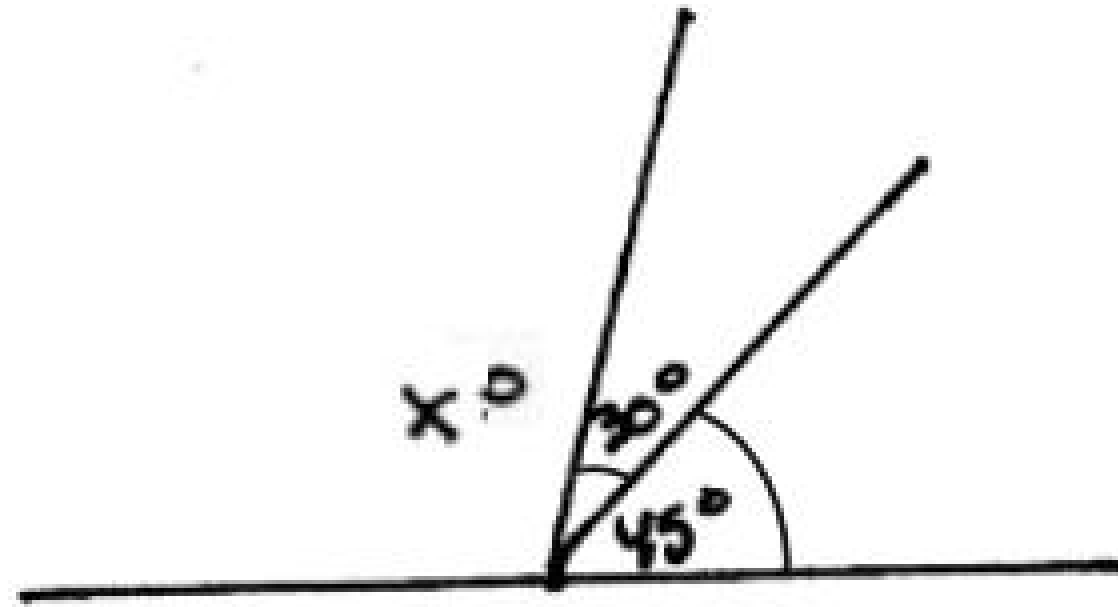Work with your partner to find the unknown angle.

Let's write an equation and use x to represent the measure of the unknown angle. Let's start with the known part. What is the known part?
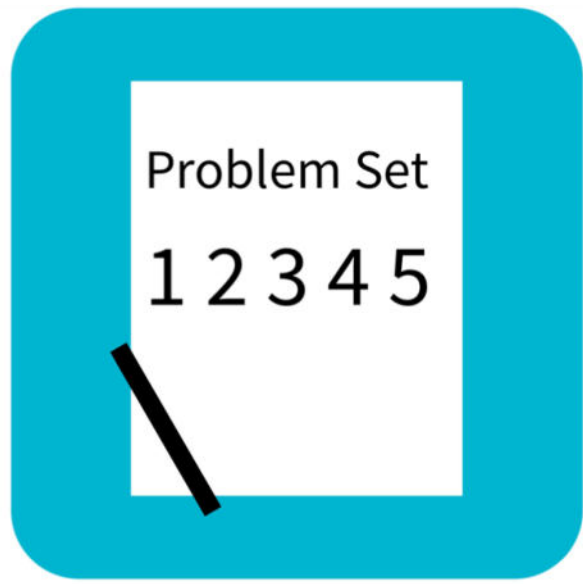
Angle Measures

What is different about this angle than the angles that we have been working with?

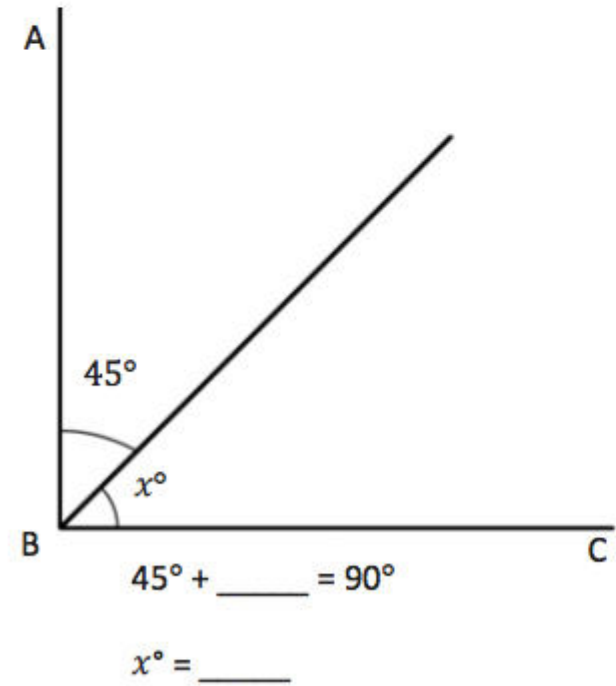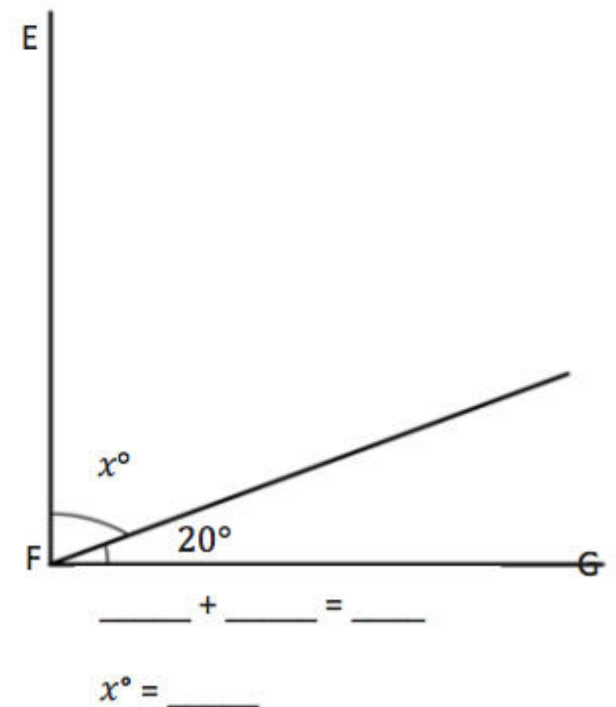How can we solve for the unknown angle? Write the equation.

Problem Set

Problem Set

1 2 3 4 5

Name _____   Date _____

Write an equation, and solve for the measure of $\angle x$. Verify the measurement using a protractor.

1. $\angle CBA$ is a right angle.

$45°$

$x°$

$45° + $ _____ $= 90°$

$x° = $ _____

2. $\angle GFE$ is a right angle.

$x°$

$20°$

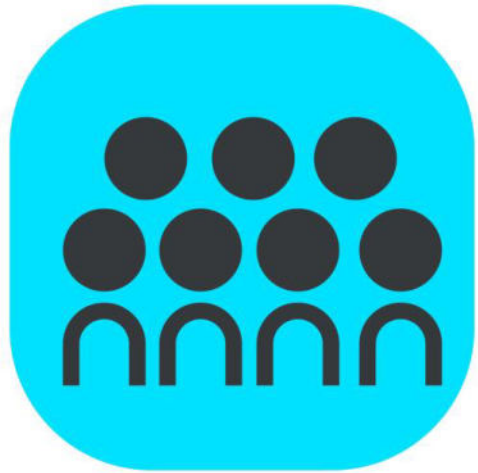_____ $+$ _____ $=$ _____

$x° = $ _____

Debrief

Participate in the discussion by...

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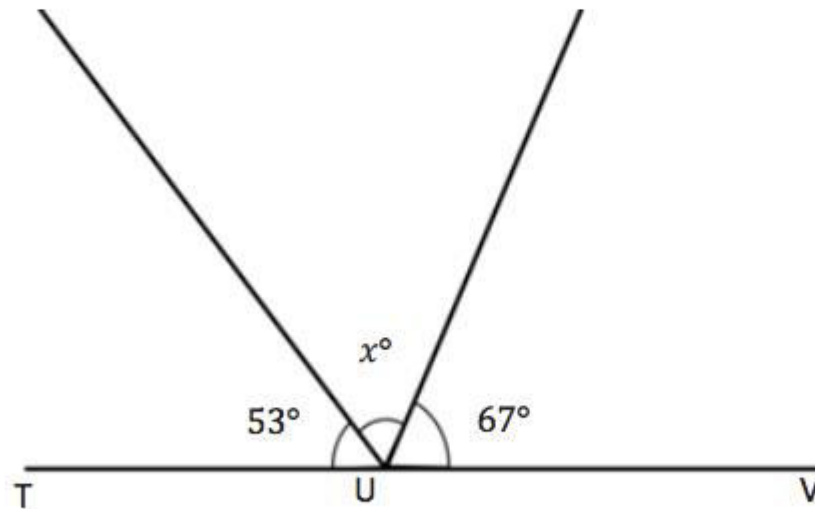- Explaining your strategy.
- Listening to others.

Debrief

- For Problems 1–6, why is it important to know that we are starting with a right angle or a straight angle?

- For Problem 7, why is it important to know that ACDE is a rectangle?

- Why is it important to be precise when measuring angles?

- When two angles add to 90°, we say that they are **complementary angles.** When two angles add to 180°, we say that they are **supplementary angles**. What examples did we have of complementary angles? Of supplementary angles?

Exit Ticket

Name _____   Date _____

Write an equation, and solve for x. $\angle TUV$ is a straight angle.

$x°$

$53°$ $67°$

T   U   V

Equation: _____