

KEY CONCEPT OVERVIEW

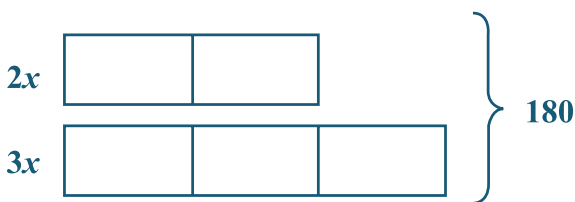
In this topic, students return to using equations to find unknown angle measures. Students write equations to model various angle relationships and solve equations to find the value that makes each equation true. Students also measure angles with a protractor to confirm solutions. In addition to familiar angle relationships, students work with **complementary** and **supplementary angles**.

You can expect to see homework that asks your child to do the following:

- Set up and solve an equation to find an unknown angle measurement.
- Explain why the solution to an equation is reasonable when examining angle relationships.
- Use ratio reasoning to write and solve equations.

SAMPLE PROBLEMS (From Lessons 1 and 3)

1. The measures of two supplementary angles are in the ratio of 2:3. Find the measurement of each angle.



$$\begin{aligned}
 2x + 3x &= 180 \\
 5x &= 180 \\
 \frac{1}{5}(5x) &= \frac{1}{5}(180) \\
 x &= 36
 \end{aligned}$$

Angle 1: $2(36)^\circ = 72^\circ$
Angle 2: $3(36)^\circ = 108^\circ$

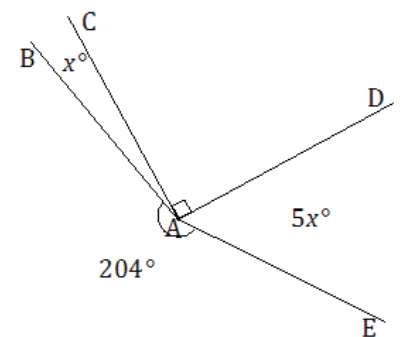
2. Four rays meet at a common endpoint. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of x . Find the measures of $\angle BAC$ and $\angle DAE$.

The sum of the degree measures of $\angle BAC$, $\angle CAD$, $\angle DAE$ and the arc that measures 204° is 360° because they are angles at a point.

$$\begin{aligned}
 x + 90 + 5x + 204 &= 360 \\
 6x + 294 &= 360 \\
 6x + 294 - 294 &= 360 - 294 \\
 6x &= 66 \\
 \frac{1}{6}(6x) &= \frac{1}{6}(66) \\
 x &= 11
 \end{aligned}$$

The measure of $\angle BAC$ is 11° .

The measure of $\angle DAE$ is $5(11)^\circ = 55^\circ$.

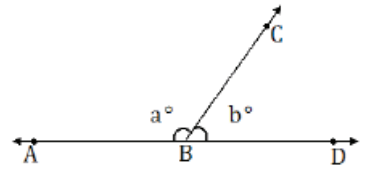


Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

HOW YOU CAN HELP AT HOME

You can help at home in many ways. Here are some tips to help you get started.

- State the name of an angle relationship presented in Lesson 1, and challenge your child to draw the angle relationship on paper. For example, if you say “angles on a line,” she should draw an image that is similar to the one shown. She should also indicate that $a + b = 180$ or the measurement of $\angle ABC$ and the measurement of $\angle CBD$ sum to 180° . (NOTE: For more angle relationships, refer to the Terms section for Grade 7 Module 3 Topic B.)
- Solving equations is a big focus in this topic. Write a variety of equations for your child to practice solving. After your child solves an equation, challenge him to check the answer by substituting the solution for the variable in the equation. If the result is a true number sentence, the answer is correct. For example, you might provide your child with the equation $2x - 4 = 10$. In this equation, $x = 7$ because $2(7) - 4 = 10$. If, however, your child solves the equation as $x = 3$, for instance, the solution is incorrect because $2(3) - 4$ does not equal 10.



TERMS

Complementary angles: Two angles whose measures sum to 90 degrees. Each angle is a complement of the other. (See Figure 1.)

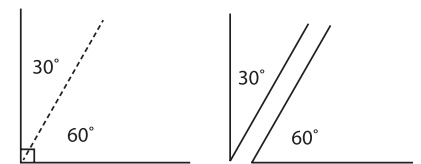


Figure 1

Perpendicular line: A straight line that intersects another line or a geometric shape at a 90 degree angle.

Supplementary angles: Two angles whose measures sum to 180 degrees. Each angle is a supplement of the other. (See Figure 2.)



Figure 2

Vertex: The point where two or more segments or rays meet. There are three vertices in the image: A, B, and C. (See Figure 3.)

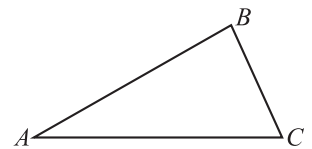


Figure 3