Unit 1 Lesson 16: Parallel Lines and the Angles in a Triangle

1 True or False: Computational Relationships (Warm up)

Student Task Statement

Is each equation true or false?

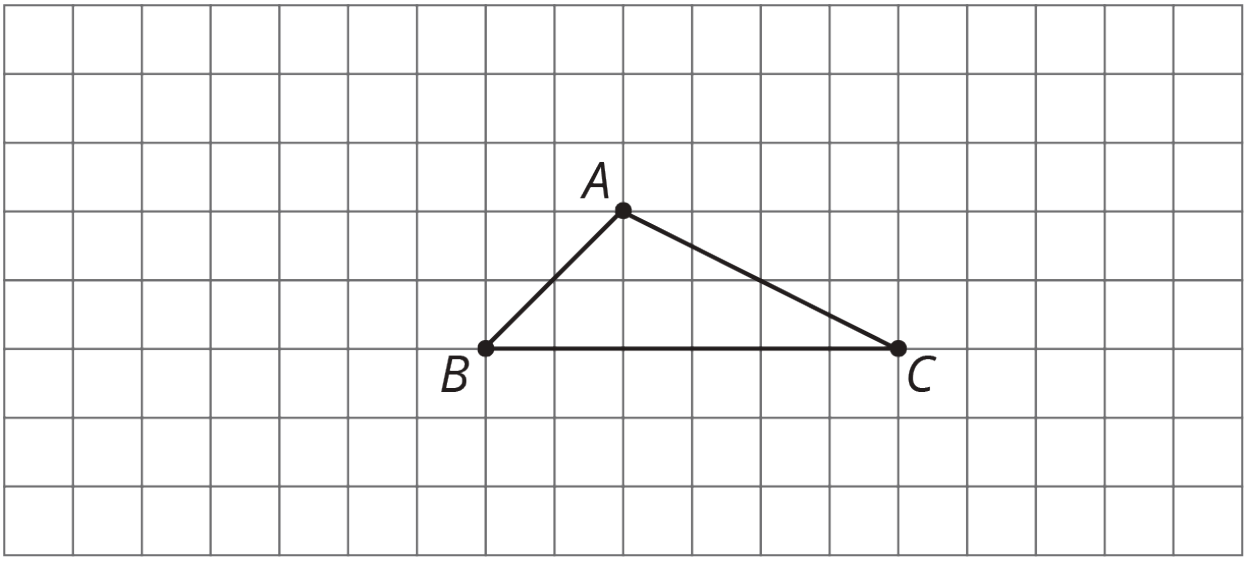
$62 - 28 = 60 - 30$

$3 \cdot -8 = (2 \cdot -8) - 8$

$\frac{16}{-2} + \frac{24}{-2} = \frac{40}{-2}$

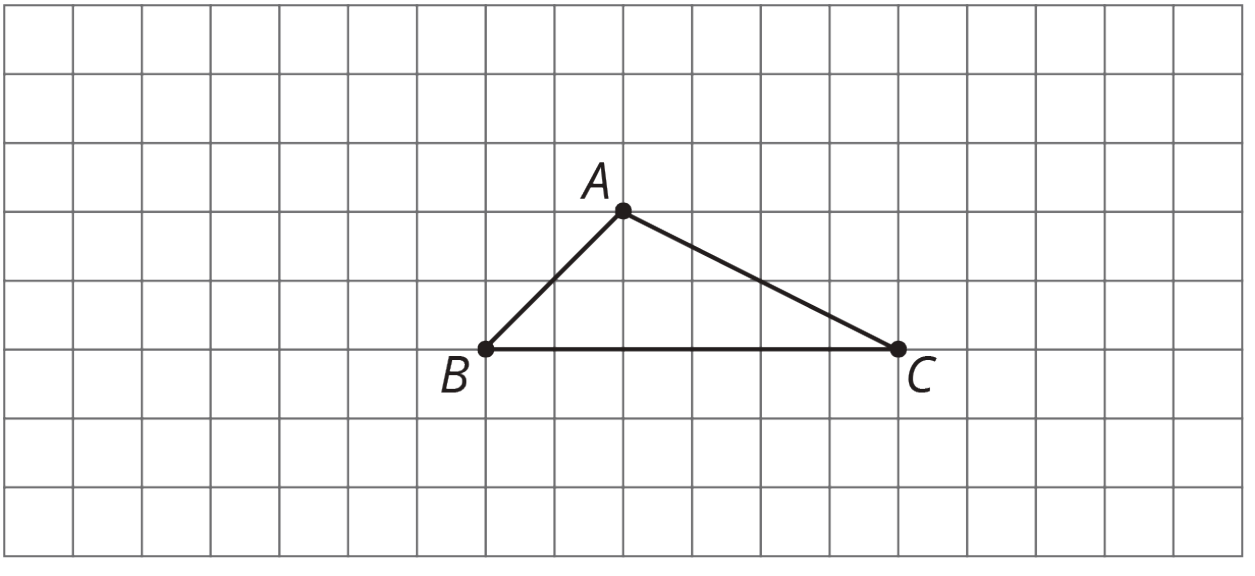
2 Angle Plus Two

Images for Launch



Student Task Statement

Here is triangle ABC.



1. Rotate triangle ABC 180° around the midpoint of side AC. Label the new vertex D.
2. Rotate triangle ABC 180° around the midpoint of side AB. Label the new vertex E.
3. Look at angles EAB, BAC, and CAD. Without measuring, write what you think is the sum of the measures of these angles. Explain or show your reasoning.
4. Is the measure of angle EAB equal to the measure of any angle in triangle ABC? If so, which one? If not, how do you know?

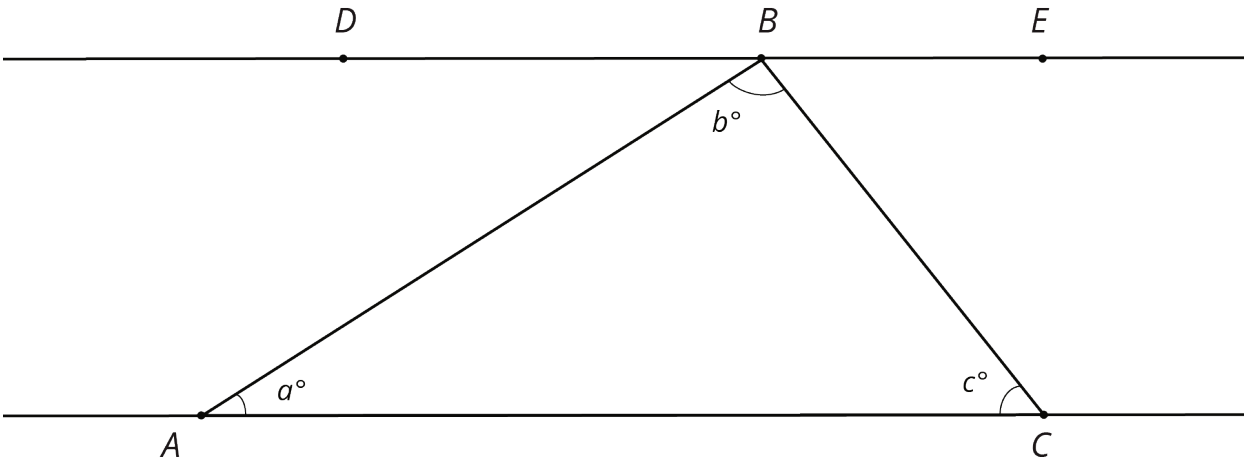
5. Is the measure of angle CAD equal to the measure of any angle in triangle ABC? If so, which one? If not, how do you know?

6. What is the sum of the measures of angles ABC, BAC, and ACB?

3 Every Triangle in the World

Student Task Statement

Here is $\triangle ABC$. Line DE is parallel to line AC.

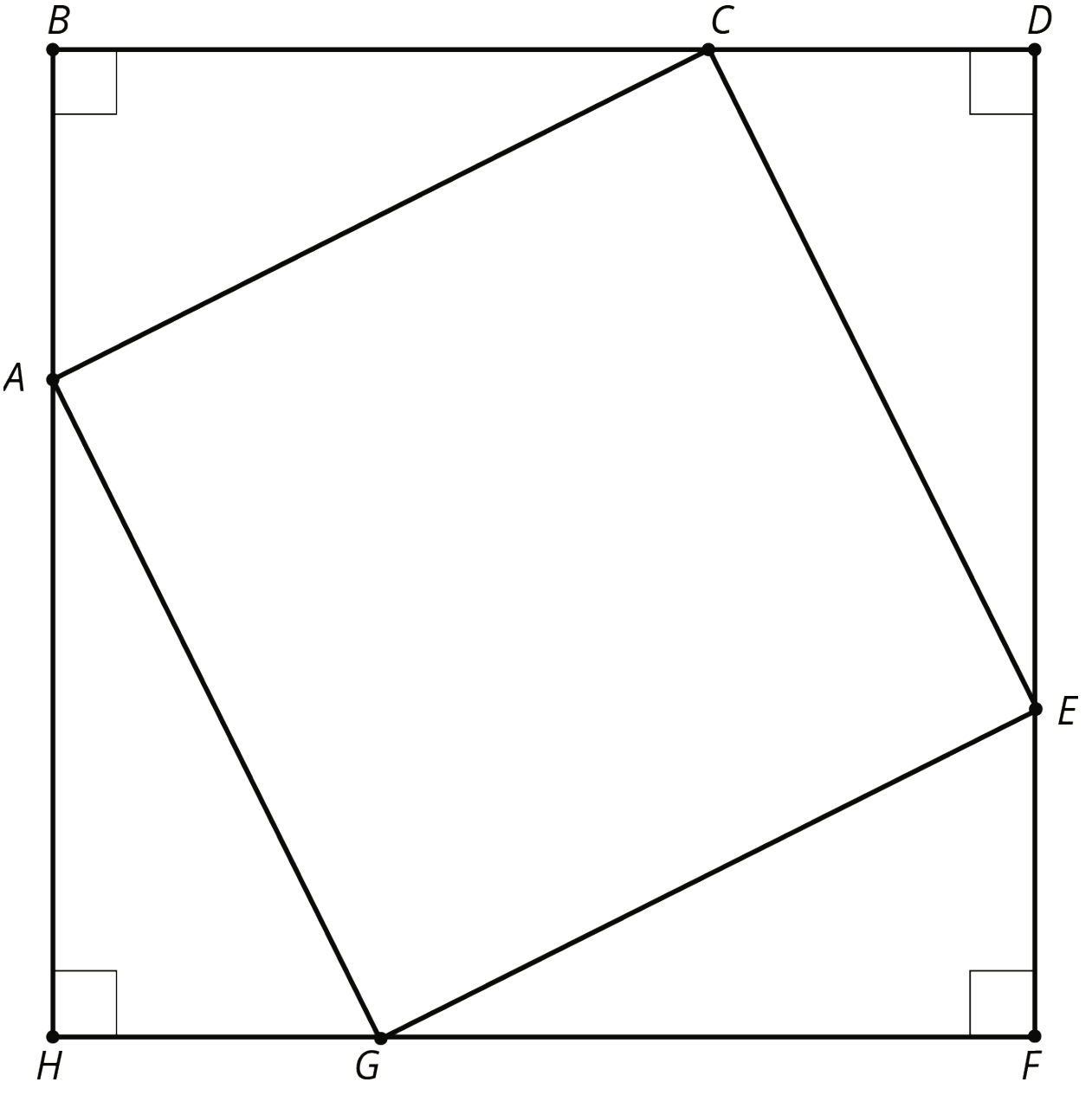


1. What is $m\angle DBA + b + m\angle CBE$? Explain how you know.
2. Use your answer to explain why $a + b + c = 180$.
3. Explain why your argument will work for *any* triangle: that is, explain why the sum of the angle measures in *any* triangle is 180°.

4 Four Triangles Revisited (Optional)

Student Task Statement

This diagram shows a square $BDFH$ that has been made by images of triangle ABC under rigid transformations.



Given that angle BAC measures 53 degrees, find as many other angle measures as you can.