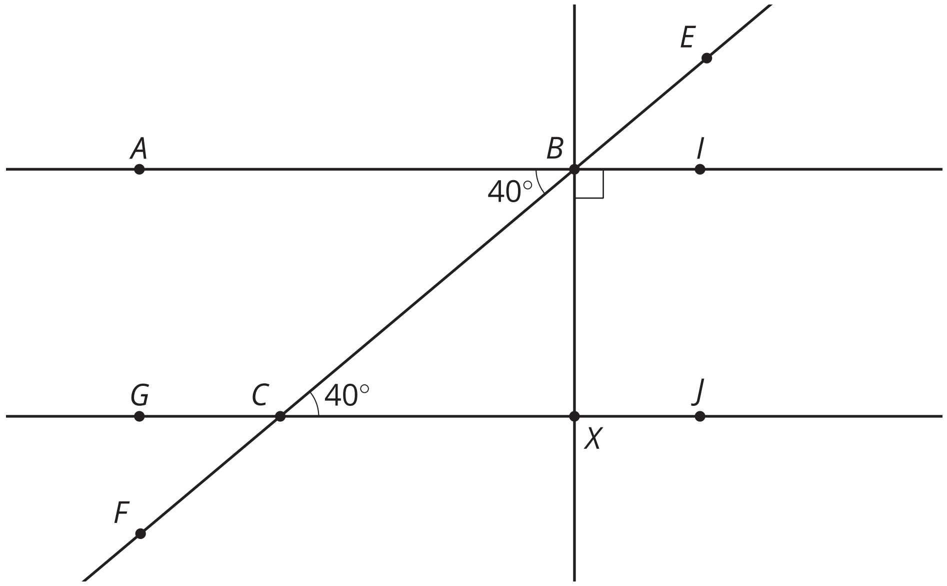
Lesson 20 Practice Problems

1. Priya: I bet if the alternate interior angles are congruent, then the lines will have to be parallel.

   Han: Really? We know if the lines are parallel then the alternate interior angles are congruent, but I didn't know that it works both ways.

   Priya: Well, I think so. What if angle ABC and angle BCJ are both 40 degrees? If I draw a line perpendicular to line AI through point B, I get this triangle. Angle CBX would be 50 degrees because $40 + 50 = 90$. And because the angles of a triangle sum to 180 degrees, angle CXB is 90 degrees. It's also a right angle!

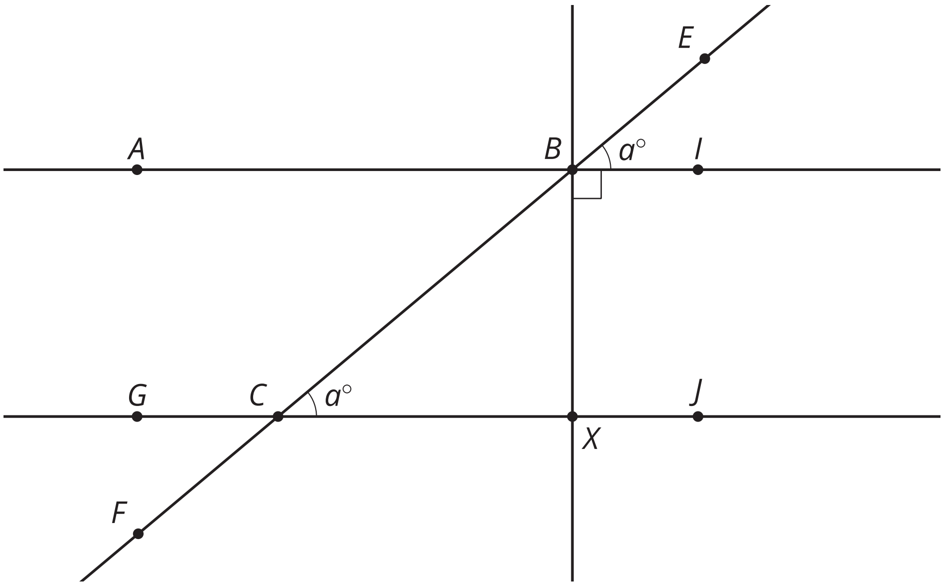
   Han: Oh! Then line AI and line GJ are both perpendicular to the same line. That's how we constructed parallel lines, by making them both perpendicular to the same line. So lines AI and GJ must be parallel.



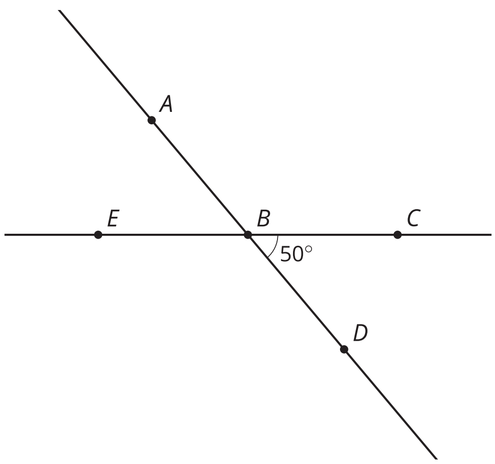
   a. Label the diagram based on Priya and Han's conversation.

   b. Is there something special about 40 degrees? Will any 2 lines cut by a transversal with congruent alternate interior angles, be parallel?

2. Prove lines AI and GJ are parallel.

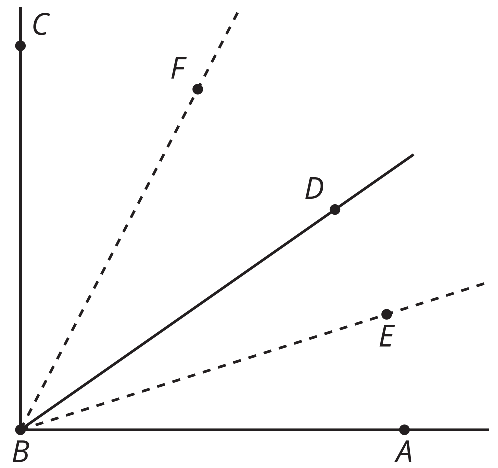


3. What is the measure of angle ABE?



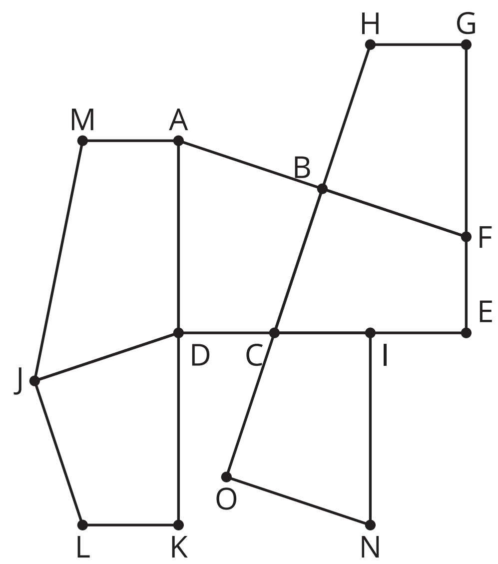
(From Unit 1, Lesson 19.)

4. Lines AB and BC are perpendicular. The dashed rays bisect angles ABD and CBD. Explain why the measure of angle EBF is 45 degrees.



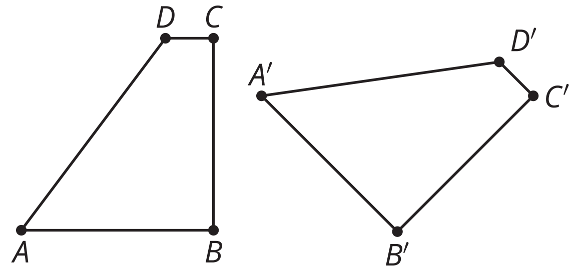
(From Unit 1, Lesson 19.)

5. Identify a figure that is *not* the image of quadrilateral $ABCD$ after a sequence of transformations. Explain how you know.



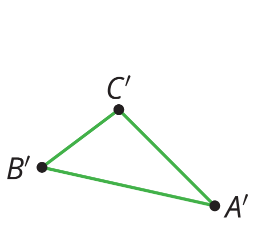
(From Unit 1, Lesson 18.)

6. Quadrilateral $ABCD$ is congruent to quadrilateral $A'B'C'D'$. Describe a sequence of rigid motions that takes A to A', B to B', C to C', and D to D'.



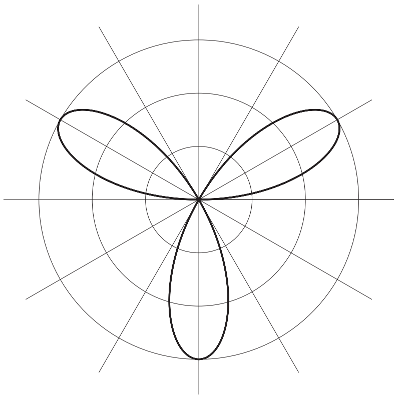
(From Unit 1, Lesson 17.)

7. Triangle ABC is congruent to triangle $A'B'C'$. Describe a sequence of rigid motions that takes A to A', B to B', and C to C'.



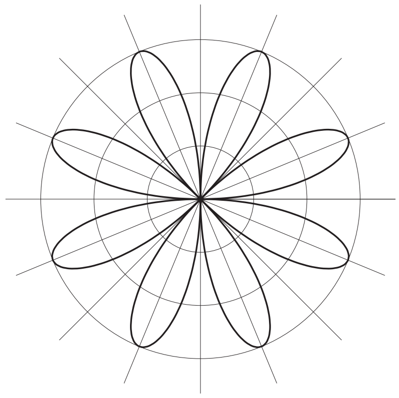
(From Unit 1, Lesson 17.)

8. Identify any angles of rotation that create symmetry.



(From Unit 1, Lesson 16.)

9. Select **all** the angles of rotation that produce symmetry for this flower.



A. 45

B. 60

C. 90

D. 120

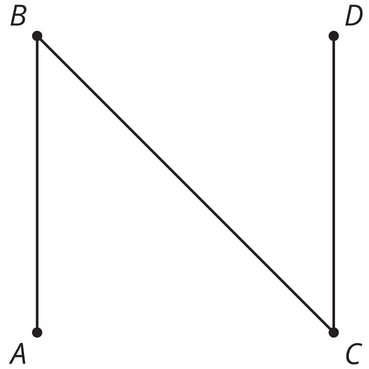
E. 135

F. 150

G. 180

(From Unit 1, Lesson 16.)

10. Three line segments form the letter N. Rotate the letter N clockwise around the midpoint of segment BC by 180 degrees. Describe the result.



(From Unit 1, Lesson 14.)