### 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.
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	1. Label the diagram based on Priya and Han's conversation.
	2. Is there something special about 40 degrees? Will any 2 lines cut by a transversal with congruent alternate interior angles, be parallel?
1. Prove lines $AI$ and $GJ$ are parallel.
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1. What is the measure of angle $ABE$?
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* (From Unit 1, Lesson 19.)
1. Lines $AB$ and $BC$ are perpendicular. The dashed rays bisect angles $ABD$ and $CBD$. Explain why the measure of angle $EBF$ is 45 degrees.
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* (From Unit 1, Lesson 19.)
1. Identify a figure that is *not* the image of quadrilateral $ABCD$ after a sequence of transformations. Explain how you know.
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* (From Unit 1, Lesson 18.)
1. 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 $D^{′}$.
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* (From Unit 1, Lesson 17.)
1. 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 $C^{′}$.
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* (From Unit 1, Lesson 17.)
1. Identify any angles of rotation that create symmetry.
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* (From Unit 1, Lesson 16.)
1. Select **all**the angles of rotation that produce symmetry for this flower.
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	1. 45
	2. 60
	3. 90
	4. 120
	5. 135
	6. 150
	7. 180
* (From Unit 1, Lesson 16.)
1. Three line segments form the letter N. Rotate the letter N clockwise around the midpoint of segment $BC$ by 180 degrees. Describe the result.
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* (From Unit 1, Lesson 14.)



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