### Lesson 7 Practice Problems

1. Triangle $ABC$ is shown with its incenter at $D$. The inscribed circle’s radius measures 2 units. The length of $AB$ is 9 units. The length of $BC$ is 10 units. The length of $AC$ is 17 units.
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	1. What is the area of triangle $ACD$?
	2. What is the area of triangle $ABC$?
1. Triangle $ABC$ is shown with an inscribed circle of radius 4 units centered at point $D$. The inscribed circle is tangent to side $AB$ at the point $G$. The length of $AG$ is 6 units and the length of $BG$ is 8 units. What is the measure of angle $A$?
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	1. $arctan\left(\frac{2}{3}\right)$
	2. $2arctan\left(\frac{2}{3}\right)$
	3. $arcsin\left(\frac{2}{3}\right)$
	4. $2arccos\left(\frac{2}{3}\right)$
1. Construct the inscribed circle for the triangle.
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1. Point $D$ lies on the angle bisector of angle $ACB$. Point $E$ lies on the perpendicular bisector of side $AB$.
	1. What can we say about the distance between point $D$ and the sides and vertices of triangle $ABC$?
	2. What can we say about the distance between point $E$ and the sides and vertices of triangle $ABC$?
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* (From Unit 7, Lesson 6.)
1. Construct the incenter of the triangle. Explain your reasoning.
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* (From Unit 7, Lesson 6.)
1. The angles of triangle $ABC$ measure 30 degrees, 40 degrees, and 110 degrees. Will its circumcenter fall inside the triangle, on the triangle, or outside the triangle? Explain your reasoning.
* (From Unit 7, Lesson 5.)
1. The images show 2 possible blueprints for a park. The park planners want to build a water fountain that is equidistant from each of the corners of the park. Is this possible for either park? Explain or show your reasoning.
* park A
* 
* park B
* 
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* (From Unit 7, Lesson 4.)
1. Triangle $ABC$ has vertices at $\left(-8,2\right),\left(2,6\right),$ and $\left(10,2\right)$. What is the point of intersection of the triangle’s medians?
* (From Unit 6, Lesson 16.)



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