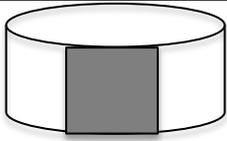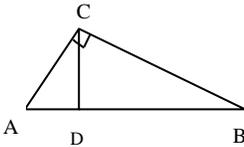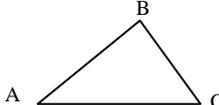Name_____

Rocket City Math League
Gemini Test

2017-2018
Round 1

Answers must be written inside the adjacent answer boxes. All answers must be written in exact, reduced, simplified, and rationalized form. All decimals and mixed numbers must be written as improper fractions. **No calculators, books, or other aides may be used.** Drawings are not to scale.   **Time Limit: 45 minutes**

1. What is the hypotenuse of a right triangle when the lengths of the legs are 28 and 96 units? *(3 points)*	
2. The angles of a triangle are 38°, 3x + 14°, and 7x - 2°. What is the value of x? *(3 points)*	
3. What is the product of the sum of all the interior angles of a regular hexagon and the sum of all its exterior angles? *(3 points)*	
4. Workers at NASA plan to map out the entire surface of the moon. Assuming the moon is a perfect sphere with a radius of 1,000 miles, what is the surface area of the moon? (Leave answer in terms of π.) *(3 points)*	
5. Stella's favorite birthday cake is chocolate with white frosting in the shape of a cylinder. Before her party, she noticed that there was a 125° arc on the side of the cake where frosting was missing (as shown). If the diameter of the cake is 24 cm and the height of the cake is 6 cm, what is the area of the region (in cm^2) that needs to be re-frosted? (Leave answer in terms of π.) *(4 points)*	
6. An alien's rectangular house is made up of 15 congruent square rooms. What is the sum of the possible perimeters of the house if its area is 960cm^2? *(4 points)*	
7. In triangle ABC, CB=15, and AB= 17. Find AD. *(4 points)*	
8. Katelin has a cylinder-shaped box. It has a height of 46cm and its base has a radius of 10cm. She wants to know how much space she has left after she puts in an ice cream cone with a height of 9 cm and a radius of 2 cm. What is the volume inside the cylinder and outside the ice cream cone? (Use 3.14 for π.) *(5 points)*	
9. A triangle is inscribed in a circle. The sides of the triangle are 15, 4, and 13. What is the radius of the circle? (Round answer up to the nearest whole number.) *(5 points)*	
10. In triangle ABC, side a=7, side b=15, and angle C= 60°. What is the sum of the length of side c and the triangle's area? *(6 points)*	

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