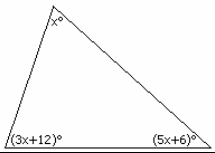
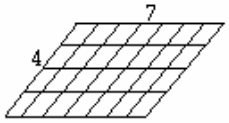
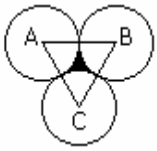
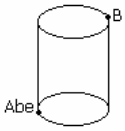
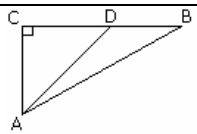
Name_____ Math Level_____

Rocket City Math League

2004-2005

Gemini Test

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, and all times must specify AM or PM (unless requested otherwise in the problem). **No calculators, books, or other aides may be used.**

1. What is the slope of the line 2x – 3y = 10? *(1 point)*	
2. Solve for x: *(1 point)* 	
3. Find the measure of the smaller angle if $m\angle ADE = 4x+1$, $m\angle EDM = 7x+3$, where A, D, and M are collinear. *(1 point)*	
4. A regular icosagon is a polygon that has 20 sides. What is the measure of an exterior angle of a regular icosagon? *(1 point)*	
5. Find the number of sides that a regular polygon has, if the sum of half of its interior angles is 540˚. *(2 points)*	
6. In ΔABC: $\overline{AB}=5$, $\overline{BC}=6$, and $\overline{AC}=7$. Find the length of the altitude from A to $\overline{BC}$. *(2 points)*	
7. How many parallelograms are in the parallelogram? *(2 points)* 	
8. In this figure, the vertices of equilateral triangle ABC are the centers of congruent circles with radii of 12. Find the area of the shaded region. *(2 points)* 	
9. Abe the ant is on a soda can that has a radius of 10 and a height of 30, as shown in the figure. He needs to get to point B on the opposite side of the can, where he can take a drink of soda. What is the shortest distance to point B, if Abe can travel only on the surface of the can? *(3 points)* 	
10. What is the area of ΔADB if $m\angle DAC = 45^\circ$, $m\angle ABC = 30^\circ$, $\overline{AC} = 2\sqrt{3}$, and $\overline{BD} = 6$. *(3 points)* 	
11. Corey, a right cone, is 9 feet tall with a radius of 6 feet. One day, Corey lost his head in frustration. The remaining part of Corey was a frustrum with a volume that was $\frac{8}{9}$ of Corey's original volume. What is the height of Corey's head? *(3 points)*	
12. A sphere is inscribed in a regular tetrahedron. If an edge of the tetrahedron is 6, then what is the surface area of the sphere? *(4 points)*	

The material on this page is the property of the Rocket City Math League. Reproduction other than for non-profit educational purposes is strictly prohibited without the expressed written consent of the RCML.