

**TEAM MATH QUEST SCORE SHEET**  
Senior High School

*2009 Senior Preliminary*  
*Category A: Algebra I or Geometry*

<b>Team Information</b>	School: _____	Center: _____
Student Names:	Grade Level:	Current Math Class:
1 _____	_____	_____
2 _____	_____	_____
3 _____	_____	_____

*Note: All answers must be in reduced form and include appropriate units of measurement.*

#	Team Answer
1	
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#	Team Answer
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23	
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27	
28	
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**For Judge's Use Only**

\_\_\_\_\_ x 4 = \_\_\_\_\_  
# correct answers

\_\_\_\_\_ x 1 = \_\_\_\_\_  
# incorrect answers  
(do not include non-responses)

**SCORE**

Senior MESA Day Prelims 2009

Team Math Quest: Category A

1. Solve for  $x$ :  $x^3 = \frac{9\sqrt{3}}{3}$

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Team Math Quest: Category A

Solve.

2.  $18y - 25 - 13y < 35y + 15 - 25y$

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Team Math Quest: Category A

3. The sum of two numbers is 17. Three times one number increased by 5 is the same as twice the other number decreased by 4. What is the larger of the two numbers?

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Team Math Quest: Category A

4. Given  $A(5, 2)$ ,  $B(-1, 4)$  and  $C(6, -5)$ . Write the equation of the line which passes through  $C$  and is parallel to  $\overleftrightarrow{AB}$ .

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Team Math Quest: Category A

5. Solve the system:  $6x - 2y = 12$   
 $-3x + y = -6$

6. The “Fibonaverage” sequence is a function  $f$  defined as follows:

$$f(1) = 180$$

$$f(2) = 60$$

$$f(n) = \frac{f(n-1) + f(n-2)}{2}, \quad n > 2$$

Find  $f(6)$ . Express your answer as a mixed number.

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Team Math Quest: Category A

7.  $3 - 8w = -4w^2$



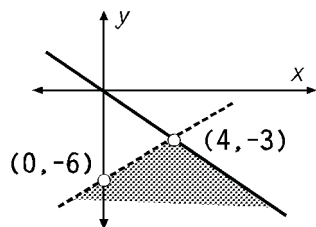
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Team Math Quest: Category A

8. The sum of a number and its square is 42. Find the number(s).

Write a set of equations that describes the shaded region.

9.



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Team Math Quest: Category A

10. How many liters of a 50% solution should be added to 40 liters of a 35% solution if the final mixture is to contain a 40% solution?

11. Simplify:  $\frac{\frac{5}{x^2-4} - \frac{3}{x-2}}{\frac{4}{x^2-4} - \frac{2}{x+2}}$

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Team Math Quest: Category A

12. Cole kicked a football. The equation  $h = -16t^2 + 60t$  describes the height of the ball  $t$  seconds after it was kicked. Approximately how many seconds went by before the ball hit the ground?

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Team Math Quest: Category A

Solve.

13.  $|4x - 9| + 20 > 35$

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Team Math Quest: Category A

14. What is the  $x$ -intercept of the line  $x + 4y = 8$ ?

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Team Math Quest: Category A

15. Factor:  $3x^2y^2 + 13xy - 10$



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Team Math Quest: Category A

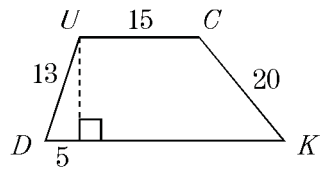
16. The perimeter of trapezoid  $WXYZ$  is 200 cm. The lengths of legs  $WX$  and  $YZ$  are 44 cm and 48 cm, respectively. What is the length of the median of this trapezoid?

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Team Math Quest: Category A

17. What is the supplement of an angle whose measure is  $60^\circ$ ?

18. Find the area of trapezoid **DUCK**.

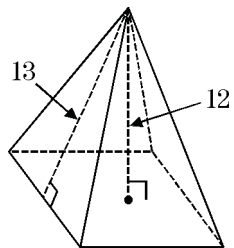


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Team Math Quest: Category A

19. The bases of a prism are equilateral triangles with sides measuring 8 cm, and the altitude measures 5 cm. Find the volume.

20. Find the lateral area of the regular pyramid.

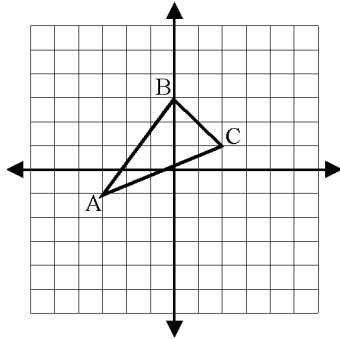


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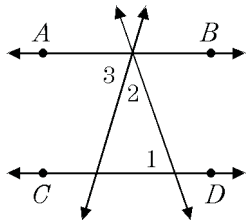
Team Math Quest: Category A

21. A right triangle has legs which measure 5 cm and 12 cm respectively. If a semicircle is constructed on each side of the triangle, what is the sum of the measures of the areas of the semicircles in square centimeters? Let  $\pi = 3.14$ .

22.  $\triangle UVW$  is congruent to  $\triangle ABC$ . If  $U(1,1)$  corresponds to  $A$  and  $V(5,-2)$  corresponds to  $B$ , then the coordinates for  $W$  must be \_\_\_\_\_.



23. In the figure,  $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$ . If  $m\angle 1 = 70^\circ$  and  $m\angle 2 = 45^\circ$ , find the degree measure of  $m\angle 3$ .



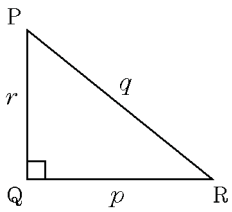


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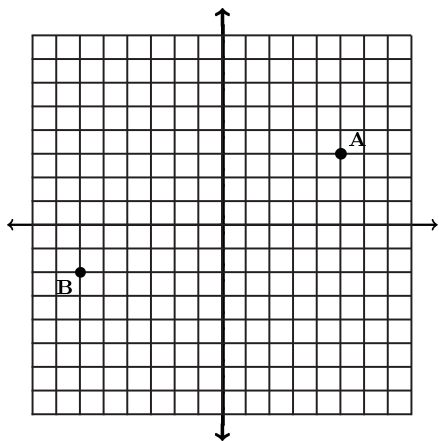
Team Math Quest: Category A

24. The sides of a triangle measures 10, 14, and 30. If the longest side of a similar triangle measures 12, find the length of its smallest side.

25. In  $\triangle PQR$ ,  $r = 9$  and  $q = 41$ . Calculate the length of side  $p$ .



26. What is the midpoint of the segment connecting points **A**(5,3) and **B**(-6,-2) ?

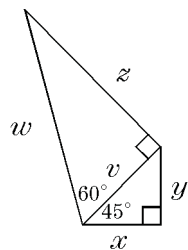


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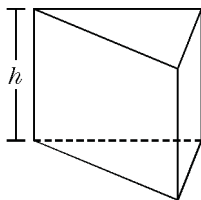
Team Math Quest: Category A

27. The side lengths of a given triangle are  $x + 3$ ,  $3x - 3$ , and  $2x + 4$ . If the perimeter of the triangle is 40, what is the length of the longest side of the triangle?

28. In the given figure, if  $x = 4$ , find the value of  $w$ .



29. The right triangular prism shown has bases that are equilateral triangles. The height  $h$  of the prism is  $2\sqrt{3}$  and the base edges each measure 4. Find the exact volume of the prism.



30. Given the following triangle,  $\sin \theta = \underline{\hspace{2cm}}$

