

TEAM MATH QUEST SCORE SHEET
Middle/Junior High School

2009 Junior Preliminary
Category II: Algebra 1 or Geometry

Team Information	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	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

#	Team Answer
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	

For Judge's Use Only

_____ x 4 = _____
correct answers

_____ x 1 = _____
incorrect answers
(do not include non-responses)

SCORE

Junior MESA Day Prelims 2009

Team Math Quest: Category II

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

Junior MESA Day Prelims 2009

Team Math Quest: Category II

Solve.

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

Junior MESA Day Prelims 2009

Team Math Quest: Category II

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?

Junior MESA Day Prelims 2009

Team Math Quest: Category II

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} .

Junior MESA Day Prelims 2009

Team Math Quest: Category II

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.

Junior MESA Day Prelims 2009

Team Math Quest: Category II

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

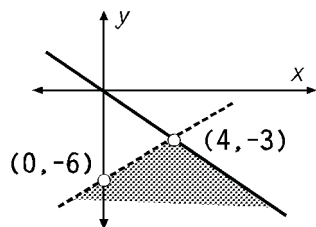
Junior MESA Day Prelims 2009

Team Math Quest: Category II

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.



Junior MESA Day Prelims 2009

Team Math Quest: Category II

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

Junior MESA Day Prelims 2009

Team Math Quest: Category II

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?

Junior MESA Day Prelims 2009

Team Math Quest: Category II

Solve.

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

Junior MESA Day Prelims 2009

Team Math Quest: Category II

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

Junior MESA Day Prelims 2009

Team Math Quest: Category II

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

Junior MESA Day Prelims 2009

Team Math Quest: Category II

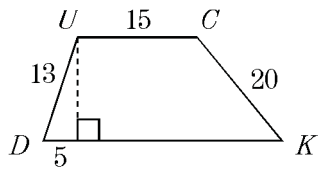
16. The perimeter of trapezoid $WXYZ$ is 200 cm. The lengths of legs WX and YZ are 44 cm and 48 cm, respectively. What is the length of the median of this trapezoid?

Junior MESA Day Prelims 2009

Team Math Quest: Category II

17. What is the supplement of an angle whose measure is 60° ?

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

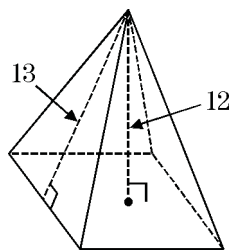


Junior MESA Day Prelims 2009

Team Math Quest: Category II

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.

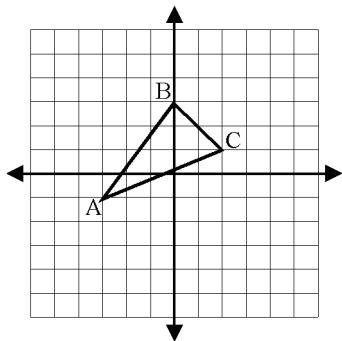


Junior MESA Day Prelims 2009

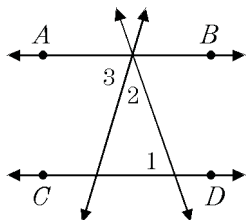
Team Math Quest: Category II

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 $m\angle 3$.

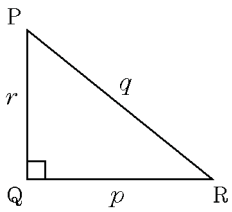


Junior MESA Day Prelims 2009

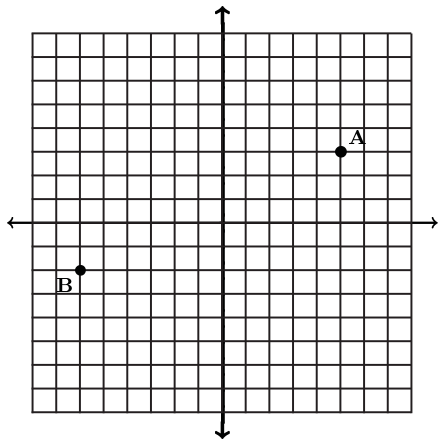
Team Math Quest: Category II

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) ?

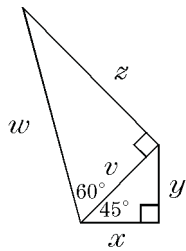


Junior MESA Day Prelims 2009

Team Math Quest: Category II

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?

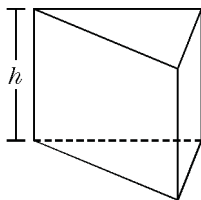
28. In the given figure, if $x = 4$, find the value of w .



Junior MESA Day Prelims 2009

Team Math Quest: Category II

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, $\sin \theta = \underline{\hspace{2cm}}$

