TEAM MATH QUEST SCORE SHEET ***2009 Junior Regional***

Middle/Junior High School *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	
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#	Team Answer
16	
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30	

For Judge's Use Only

_____ **x 4 =** _____

 # correct answers

minus

_____ **x 1 =** _____

 # incorrect answers

(do not include non-responses)

SCORE

Junior Regional MESA Day 2009

Team Math Quest: Category II

1. How many liters of a 48% solution should be added to 25 liters of a 32% solution if the final mixture is to contain a 40% solution?

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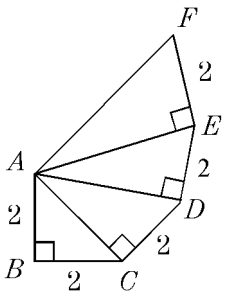
2. Find the length of $\overline{AF}$. Express your answer in simplest radical form.



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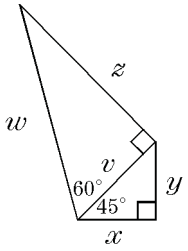
Team Math Quest: Category II

3. In the given figure, if $z = 4\sqrt{3}$, find the value of y.



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Team Math Quest: Category II

4. In equilateral $\triangle ABC$, $AB = \frac{1}{2}x + 5$, and $BC = 2x - 13$. What is the perimeter of this triangle?

5. Find the difference $3 - \dfrac{-t}{t+2} - \dfrac{2}{t^2-4}$, and express in lowest terms.

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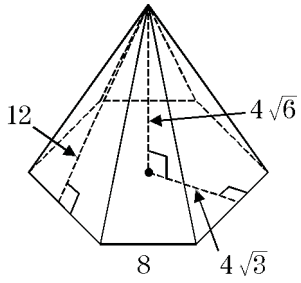
Team Math Quest: Category II

6. Find the lateral area of the regular pyramid.



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Team Math Quest: Category II

7. What is the sum of the lengths of all the edges of a cube if the volume of the cube is 64?

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Team Math Quest: Category II

8. Which factor do the following trinomials have *in common*?

$x^2 - x - 20$ $\quad$ $x^2 - 2x - 24$

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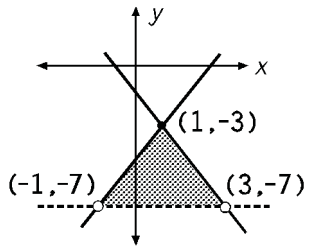
Write a set of equations that describes the shaded region.

9.



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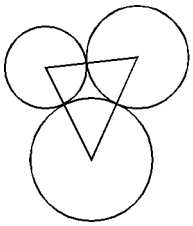
Team Math Quest: Category II

10. The radii of 3 mutually tangent circles are consecutive positive integers. In the figure, the triangle formed by connecting the centers of the circles has a perimeter of 30 units. Find the circumference of the largest circle.



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Solve.

11. $-13-4f \geq -5f-8-2f-21$

12. $15 < 5\,|2c - 7| < 35$

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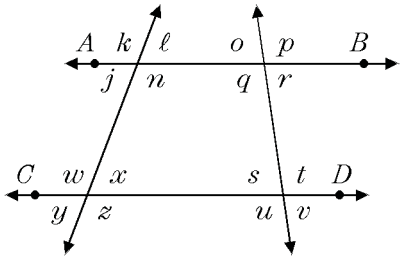
13. In the figure, $\overleftrightarrow{\mathbf{AB}} \parallel \overleftrightarrow{\mathbf{CD}}$ with $m\angle j = 63$, and $\angle n$ and $\angle q$ are supplementary. Find $m\angle v$.



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Team Math Quest: Category II

14. If the width of a rectangle is three feet less than the length and the area is 108 square feet, find the length of the rectangle.

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Team Math Quest: Category II

15. The winner of an art contest receives $200, plus the amount the winning painting is sold for, less a 10% commission. If the winner is given $875, how much did the painting sell for?

16. Solve the system: $\frac{4}{3}x + \frac{2}{3}y = \frac{32}{3}$
$\frac{5}{2}x - y = -\frac{5}{2}$

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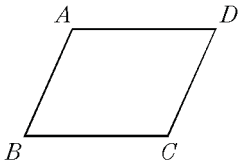
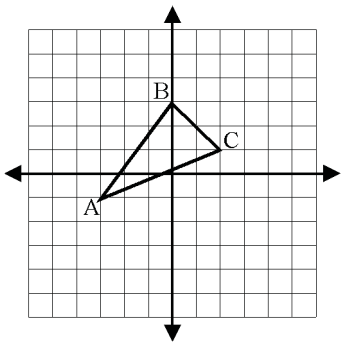
17. In the diagram, $\square$**ABCD** is a parallelogram. If $\mathbf{AB} = x + 5$, $\mathbf{BC} = 4x + 2$, and the perimeter of $\square$**ABCD** is 200, what is the length of **AB**?

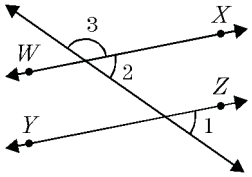


18. $\triangle$**UVW** is congruent to $\triangle$**ABC**. If **U**$(1, -2)$ corresponds to **A** and **V**$(5, -5)$ corresponds to **B**, then the coordinates for **W** must be _____.



19. **M** is the midpoint between two points **W** and **X**. The coordinates of point **W** are (j, k) and the coordinates of point **X** are $(3j, -5k)$. What are the coordinates of point **M**?

20. $\overleftrightarrow{\mathbf{WX}}$ is parallel to $\overleftrightarrow{\mathbf{YZ}}$. If the measure of $\angle 3$ is 150°, what is the measure of $\angle 1$?



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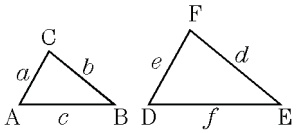
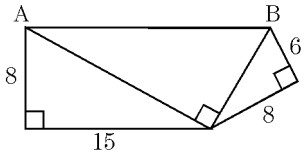
21. In the diagram shown, $\triangle\mathbf{ABC} \sim \triangle\mathbf{DEF}$, $a = 8$, $b = 6$, and $e = 15$. Find d.



22. Find the exact length of **AB** in the diagram.



23. What is the x-intercept of the line $2x - 6y + 24 = 0$?

24. Given $P(-3,-4)$, $Q(-8,-3)$ and $R(-1,4)$. Write the equation of the line which passes through Q and is perpendicular to $\overleftrightarrow{\mathbf{PR}}$.

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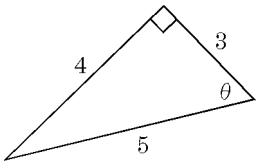
25. A gym has a wall with a length six feet more than three times the height. If a can of paint that covers 900 square feet was just enough to paint the wall, what is the *approximate* length of the wall?

26. Given the following triangle, $\tan\theta =$ ____



27. Solve for x: $x^3 = \dfrac{8\sqrt{2}}{4}$

Find a quadratic equation with the given root(s).

28. $-\frac{1}{2}, \frac{8}{9}$

29. The bases of a right triangular prism have sides of 6 m, 8 m, and 10 m. The volume of the prism is 312 cubic meters. Find the height of the prism.

30. Given the table:

x	1	2	3	5	8	11
$f(x)$	4	9	14	24	39	54

Find a linear rule (in simplest form for $f(x)$ in terms of x).