

TEAM MATH QUEST SCORE SHEET

2013 Junior MESA Day

TEAM INFORMATION		
School: _____	Center: _____	
Student Names:	Grade:	Current Math Class:
1 _____	_____	_____
2 _____	_____	_____
3 _____	_____	_____
4 _____	_____	_____

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

#	Team Answer	#	Team Answer	#	Team Answer
1		11		21	
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

FOR JUDGE'S USE ONLY				
# Correct answers		x 4 pts	=	
			<i>minus</i>	
# Incorrect answers <i>(do not include non-responses)</i>		x 1 pt	=	
			TOTAL SCORE	

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1. Marvin mixed 3 drops of red paint and 2 drops of blue paint to make his favorite purple color. He mixed more paint and used 12 drops of blue. How many drops of red paint did Marvin use?

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2. A scientist finds the diameter of a microscopic organism to be 0.0000035 mm. What would this number be written in scientific notation?

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3. The opposite of a number is cubed, and then the reciprocal is taken. If the original number was three less than x , what is the formula of the result?

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4. An old wooden flagpole breaks at a point 8 feet above the ground. The top of the pole then falls to the ground, landing 15 feet from the bottom. If the pole stays connected at the breaking point, so that it forms a right triangle with the ground, how tall was the pole before it broke?

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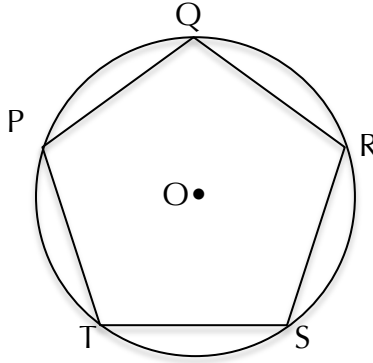
5. Simplify: $\sqrt[3]{-8a^{15}b^6}$

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6. The water temperature for a manufacturing process should be kept at 150° F. A computer program uses the inequality $|t - 150| < 5$ which describes the acceptable water temperature, t , in degrees. What is the range of acceptable temperature for the water?

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7. In the figure below, the equilateral polygon $PQRST$ is inscribed in circle O . If the diameter of circle O is 10, what is the length of arc PQR in terms of π ?



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8. The amount of water needed to moisten a cloth is directly proportional to the area of the cloth. If 8 drops are needed to moisten a 2 inch by 2 inch section, how much water will be needed to moisten a section 4 inches by 4 inches?

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9. Luis was painting a long fence. When he had painted 5 feet less than $\frac{2}{3}$ of the fence, he noticed he had painted 77 feet. How long is the fence he is painting?

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10. The coordinates of the midpoint of \overline{EF} are $(1,1)$. If the coordinates of E are $(-7,-5)$ and the coordinates of F are $(9,k)$, what is the value of k ?

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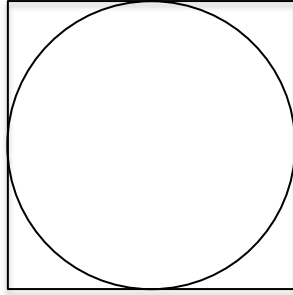
11. Nicole found a length of rope that measured $7\frac{1}{8}$ feet long. She needed a piece $\frac{3}{4}$ foot long for an art project, so she cut that amount from the rope she found. How much rope did she have left to use later?

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12. Pleasantville has a high temperature of 104° F. What temperature is this in $^{\circ}$ C?

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13. In the figure below, a circle is inscribed in a square. If the diagonal of the square is 10, what is the radius of the circle?



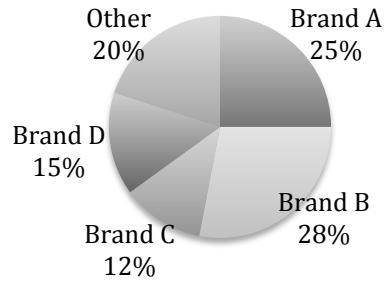
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14. Two lights are flashing. The red light flashes every 4 seconds and the yellow light flashes every 22 seconds. When the two lights flash at the same time, how many seconds will pass before they flash at the same time again?

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15. The chart shows the percentage of automobile sales for various makes of cars. If 3500 cars were sold overall, how many cars of Brand B were sold?

Brands of Cars Sold



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16. The cost of 250 bricks, delivered to a worksite, is \$170. The cost of 400 bricks delivered is \$245. How much would it cost to have 320 bricks delivered (assuming a linear relationship)?

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17. A rectangle is constructed with 10 feet of string. If the length of the rectangle is $2\frac{8}{14}$ feet long, what is the width in fraction form?

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18. Sales for the first three days at a new trendy boutique were \$460, \$562, and \$664. What is a good prediction for combined sales for the next *two* days (assuming sales continue to grow at the same rate)?

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19. Find the equation of the line perpendicular to the line passing through the coordinates $(-2,4)$ and $(1,1)$ with the same y -intercept.

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20. In rhombus $ABCD$, diagonals AC and BD are 6 and 8 respectively. The perimeter of the rhombus is:

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21. For a science project at a high school, the teachers lined up the students and had them count off in groups of 9. If you were the 84th student in line, what number would you be given?

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22. Rafael has 8 sacks of flour. Some of his sacks weigh 3 pounds, and the others weigh 7 pounds. The total weight of his flour is 36 pounds. How many 7-pound sacks does he have?

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23. A cubic foot of liquid is poured into a rectangular box whose base is 18 inches by 12 inches. How high up will the water rise?

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24. Evaluate the expression: $a + (b \div c)$ for $a = -2$, $b = 12$, and $c = 4$.

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25. Factor completely: $12x^3 + 8x^2 + 4x$

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26. Two complementary angles measure x° and y° . If $2x - y = 60$, then the value of x is:

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27. The cooking instructions stated that a stuffed turkey should be cooked 25 minutes per pound. How many hours will it take to cook an 18 pound stuffed turkey?

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28. If digits can be repeated, how many three-digit numbers can be formed using the digits 2, 4, 6, and 7?

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29. Solve for x : $2x^2 + 5x - 1 = 0$

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30. How many milliliters of water should be evaporated from a 10 milliliters mixture that is 30% salt in order to be left with one that is 50% salt?