WTN
Math Meet

7^{th} & 8^{th} Grade
Practice Tests

Please keep these practice tests in a file
for reuse in upcoming years!

Regional Math Meet
7/8 Grade 2003-04

EVENT #1 COMPUTATION PROBLEMS **ANSWERS**

1. (4 POINTS)
   1/4 = 1/5 + 1/N; FIND N. 1._____

2. (4 POINTS)
   On a number line, point A has coordinate -6, and point B has coordinate +3. Find a point C, not equal to A such that segment AB = segment BC. 2._____

3. (6 POINTS)

   What is the value of $\frac{(X-1)!}{(X-3)!}$ FOR X =101 3._____

4. (6 points)

   Solve: 3! x 4! 4._____

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EVENT #2 CONSUMER PROBLEMS **ANSWERS**

1. (4 POINTS)
For a parking meter, one quarter earns 30 minutes of parking time, one dime earns 15 minutes, and one nickel earns 7 minutes. What is the minimum cost to park for an hour and 20 minutes using only nickels, dimes and quarters? 1. _____

2. (4 POINTS)
A stereo system sold for $660 dollars after a discount of 25% had been applied. What was the pre-sale price? 2. _____

3. (6 POINTS)
Megan earns a commission of 1.5% on the selling price for each car that she sells. Last year she sold 106 cars and earned $ 19,716 in commissions. Determine the average selling price of the cars she sold. 3. _____

4. (6 POINTS)
Kim and Julie have lunch together. When the bill comes, Kim wants to leave 15% of the bill as a tip. julie wants to leave $ .77 more, so the tip will total 20%. What was the original bill before the tip? 4. _____

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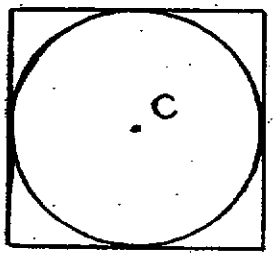
EVENT #3 GEOMETRY AND MEASUREMENTS ANSWERS

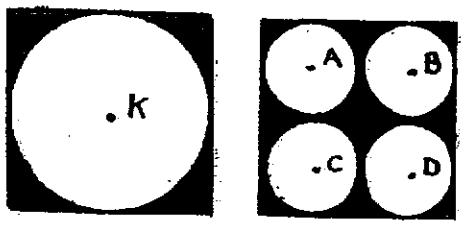
1. (5 POINTS)
A circle is inscribed in a square.
Determine the ratio of the circumference of the circle to the perimeter of the square.
Express your answers in terms of (pi).

1. _____



2. (5 POINTS)
In the figure below, **square 1** and **square 2** both have an area equal to 36 cm. sq. If circle K is inscribed in square 1 and if circles A, B, C, and D each touch the square in exactly two points, then what is the difference in the shaded areas of the two figures?

2. _____



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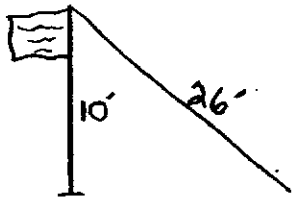
3. (5 POINTS)
What is the number of inches in the height of an equilateral triangle whose perimeter equals 30 inches? Express your answer in radical form.

3._____

4. (5 POINTS)
A flagpole placed in sand stands 10 ft. above the ground. A 26 ft. string is attached at the top and is stretched to the ground. What is the area in sq. ft., of the largest circle that could be drawn with the end of the string in the sand? express your answers in terms of (pi).

4._____



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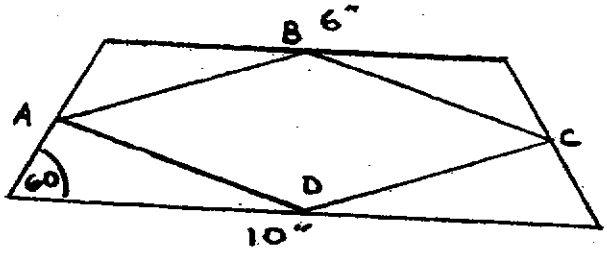
EVENT # 5 TEAM PROBLEM SOLVING **ANSWERS**

1. (20 POINTS)
The lengths of the bases of the isosceles trapezoid shown are 6 and 10 inches. If one of the base angles is given at 60 , and if A, B, C, and D are the midpoints of the sides of the trapezoid, then what is the area of quadrilateral ABCD? Express your answer in simplest radical form. 1. _____

(HINT; in a 30, 60, 90 right triangle, what is the relationship between the side opposite the 30 angle and the hypotenuse)?



2. (20 POINTS)
If the end of the year math test was worth 180 points and the test contained only 5 pt. and 3 point questions, then how many 5 pt. questions would there be on the test? 2. _____
(The test contains 42 questions.)

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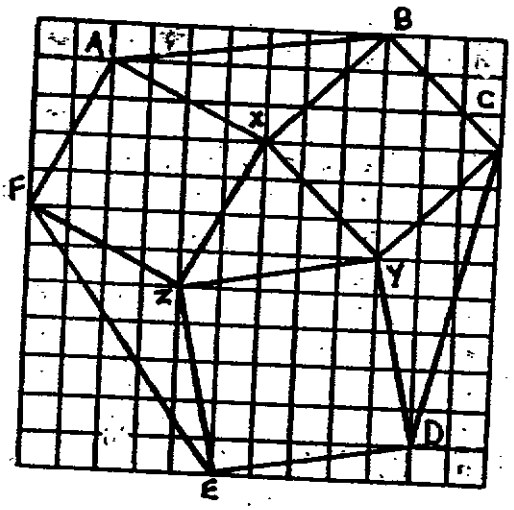
3. (20 POINTS)
Using the figure provided, find the following:

a. the area of hexagon ABCDEF a._____

b. if this hexagon were a dartboard, then what would be the probability of a dart which hits the board, landing in XYZ? b._____



4. (20 POINTS)
On a placement test for gifted math students, all the scores were between 60 and 100, and all the scores were prime numbers. To the nearest tenth, what was the mean score for the 8 students who took the test if each students score was different? 4._____

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5. (20 POINTS)
On the second day of her appearance on a daily game show, Mildred increased her winnings by 70%. However, on the third day she lost 70% of her total from day two. What % of her first day winnings now remains? Give your answer to the nearest whole %.

5. _____

NAME _____
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SCORE
_____

REGIONAL MATHEMATICS MEET
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EVENT #4 Answer Sheet

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

NAME _____

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1. 15 x 44

2. 25% of $140

3. $2^3 \times 5^2 \times 7^0$

4. 865×10^{-2}

5. $5! =$

6. $(8 + 16 / 4 - 3)^2$

7. $\dfrac{34 + 16 - (2 \times 5^2)}{3}$

8. $N \div 2/3 = 12$

FIND N

9. $\frac{8}{12} = \frac{28}{N}$

FIND N

10. $3^2 : 2^2 = 6^2 : 2^N$

FIND N

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Answer Key

EVENT #1 COMPUTATION

	POSSIBLE PTS.	ANSWER
1.	4	N=20
2.	4	12
3.	6	9,900
4.	6	12

EVENT #2 CONSUMER PROBLEMS

1.	4	$ .55
2.	4	$ 880.
3.	6	$12,400
4.	6	$15.40

EVENT #3 GEOMETRY AND MEASUREMENT

1.	5	PI/4
2.	5	0
3.	5	5 3
4.	5	576(pi) sq. ft.

EVENT #4 MENTAL MATH (ALL PROBLEMS ARE 1 POINT)

1.	660	6.	81
2.	$35	7.	O
3.	200	8.	N = 8
4.	8.65	9.	N = 42
5.	120	10	N=4

EVENT #5 TEAM PROBLEM SOLVING

1.	20	8 3
2.	20	27 PROBLEMS
3.	20	a. 100 sq. units b. 9 / 100
4.	20	77.5
5.	20	51%

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Answer Key

EVENT #1 COMPUTATION

	POSSIBLE PTS.	ANSWER
1.	4	N=20
2.	4	12
3.	6	9,900
4.	6	12144

EVENT #2 CONSUMER PROBLEMS

1.	4	$ .55
2.	4	$ 880.
3.	6	$12,400
4.	6	$15.40

EVENT #3 GEOMETRY AND MEASUREMENT

1.	5	PI/4 $\frac{\pi}{4}$
2.	5	0 No difference, same
3.	5	$5\sqrt{3}$
4.	5	576(pi) sq. ft.

EVENT #4 MENTAL MATH (ALL PROBLEMS ARE 1 POINT)

1.	660	6.	81
2.	$35	7.	O
3.	200	8.	N = 8
4.	8.65	9.	N = 42
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EVENT #5 TEAM PROBLEM SOLVING

1.	20	$8\sqrt{3}$
2.	20	27 PROBLEMS
3.	20	a. 100 sq. units b. 9 / 100
4.	20	77.5
5.	20	51%

2005 Mega-Math Meet Gr. 7-8

Event 1: Computation

1. Express this fraction in lowest terms: $\dfrac{\frac{1}{1+3}-\frac{1}{3}}{\frac{1}{3}}$.

2. Evaluate and simplify each algebraic expression for $p=-4$, $q=8$, and $r=-10$.

   a. $\dfrac{r+\sqrt{r^2-q^2}}{p}$

   b. $\dfrac{-(p+2)^3-3r}{2-q}$

3. The product of two consecutive odd numbers is 1 less than 4 times their sum.
   a. If the first of the two integers is labeled x, set up the algebraic equation that represents the information given.
   b. Find all possible pairs of odd numbers that satisfy the statement.

Event 2: Problem Solving

1. Toma's team entered a mathematics contest where teams of students compete by answering questions that are worth either 3 points or 5 points. No partial credit was given. Toma's team scored 44 points on 12 questions. How many 5-point questions did the team answer correctly?

2. Amy came in first in the 100 meter dash. When Amy crossed the finish-line Bobby – who came in second – had 10 meters to go. When Bobby crossed the finish-line Cathy – who came in third – had 10 meters to go. How far was Cathy from the finish-line when Amy crossed it and won the race?

3. Mr. Garcia donated a big pan of brownies for our team to sell at the Spring Fair. Ms. Hunter was the first in line – she purchased 2/3^{rds} of the brownies for the class picnic. Next Principal O'Keefe purchased all but 1/4th of what was left from Ms. Hunter's purchase for the faculty meeting. Then Natalie bought 3/5th of what remained for the student workers. There were only two brownies left (that went unsold). If brownies sold for 25 cents each, how much money did our team make from Mr. Garcia's brownies?

Event 3: Geometry & Measure

1. What is the length of the longest pole that can fit in a box with dimensions 3 inches by 4 inches by 12 inches?

2. A recycling bin is in the shape of a rectangular box. Find the volume of the box if its length is 18 ft, its width is 8 ft, and surface area is 496 ft^2. (Assume that the given surface area includes the lid.)

3. A pyramid has a square base of area 10,000 and the peak is directly over the center of the base at a height of 80 ft.
   a. What is the distance from a corner of the base to the peak of the structure?
   b. What is the area of the roof?
   c. What is the volume of the structure?

Event 4: Mental Math

1. Compute: $7 \cdot (5+8) - 13$
2. At a 7% off sale, estimate how much a $3,650 computer will cost.
3. Where does the line $2x+5y=12$ intersect the line $y=4$?
4. For the data set $\{1, 2, 3, 46, 48\}$:
   a. Mean = _____
   b. Median = _____
5. Evaluate and simplify: $20-16 \div 4$
6. What is the slope of the line perpendicular to $2x-3y=14$?
7. Evaluate and simplify: $\frac{15^4}{5^4}$.
8. Solve for x: $|x+1|=|x-5|$.
9. $\sqrt{25+144}$ = (pick one!)
   a. 17 b. 13 c. ±17 d. ±13
10. How many numbers between 1 and 100 contain the digit 3?

Event 5: Team event Solve any two (your choice) of the problems below. Your team may submit a single solution to each of your two choices. Be sure to indicate the number/s of the problems you wish to have graded.

1. There are **FOUR** ways that you can write 3 as the sum of positive whole numbers - if different orders count as different ways (so 1 + 2 and 2 + 1 count as two different ways) *and* if you count 3 itself as one of the ways. So, the four ways are: $1+1+1,\ 1+2,\ 2+1,\ 3$.

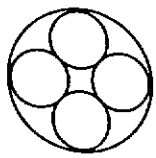
   Question: How many such ways can you write 10 as the sum of positive whole numbers?

   [Hint: DON'T try to solve this by listing all of them – there are way too many.]

2. Pick any three digits from {0, 1, 2, 3, 4, 5, 6, 7, 8, 9} – you may pick a digit more than once. What is the probability that the product of the three digits is divisible by 3?

3. Chef Fidencio's four favorite recipes appear on different pages of his cookbook, which has recipes on page 5 through 420. The four recipes have page numbers that collectively have no repeated digits. The page number of the stuffing recipe is a divisor of the other three page numbers. The borscht page number, which is not composed entirely of consecutive digits (like 345 or 456), is more than twice the fudge page number – which, in turn, is exactly five times the rarebit page number. On what pages of his cookbook can Chef Fidencio find his favorite recipes?

4. A circle of radius 4 contains four congruent circles as in the diagram below, what percentage of the area of large circle is NOT contained in any of the smaller circles?



Event 1: (20 points)

	Correct Answer	Points
1.	$-\frac{1}{4}$	4
2. a)	1	4
2. b)	$-\frac{19}{3}$ or $-6\frac{1}{3}$	4
3. a)	$x\cdot(x+2)=4\big((x)+(x+2)\big)-1$	2
3. b)	or $x^2-6x-7=0$ or $(x-7)\cdot(x+1)=0$	
	-1 & 1 and 7 & 9	6
	TOTAL	20

	Incorrect Answer	Partial credit
1.	*	0
2. a)	* $6\frac{3}{6}$	2
2. b)	*	0
3. a)	*	0
3. b)	$(-1+1)$ or -1 and 7 or $(7+9)$	3

If answer NOT simplified or in lowest terms but is correct - ½ credit

If no label - take one off

Event 2: (20 points)

	Correct Answer	Points
1.	4	6
2.	19 m	6
3.	$14.50	8
	TOTAL	20

	Incorrect Answer	Partial credit
1.	8	4
2.	19 / 81	5 / 3
3.	58	6
	TOTAL	20

Event 3: (20 points)

	Correct Answer	Points
1.	13 inches	**4**
2.	$576\ \text{ft}^3$	**4**
3. a)	$10\sqrt{114}$ ft. or 106.77 ft or 107 ft.	**4**
3. b)	$2000\cdot\sqrt{89}\ \text{ft}^2$ or $18867.96\ \text{ft}^2$ or $18868\ \text{ft}^2$.	**4**
3. c)	$\frac{8}{3}\cdot 10^5\ \text{ft}^3$ or $2.67\cdot 10^5\ \text{ft}^3$ or $266667\ \text{ft}^3$ or $266666.67\ \text{ft}^3$	**4**
	TOTAL	**20**

	Incorrect Answer	Partial credit
1.	13	**3**
2.	576	**3**
3. a)	$10\sqrt{114}$ or 106.77 or 107	**3**
3. b)	$2000\cdot\sqrt{89}$ or 18867.96 or 18868	**3**
3. c)	$\frac{8}{3}\cdot 10^5$ or $2.67\cdot 10^5$ or 266667 or 266666.67	**3**

Event 4: (20 points)

	Correct Answer	Points
1.	78	**2**
2.	\$3300.00 to \$3500.00	**2**
3.	(–4, 4)	**2**
4.	Mean = 20 Median = 3	**2**
5.	16	**2**
6.	$-\frac{3}{2}$	**2**
7.	81	**2**
8.	2	**2**
9.	13 or b	**2**
10.	19	**2**
	TOTAL	**20**

	Incorrect Answer	Partial credit
1.	*	
2.	*	
3.	–4	**1**
4.	*	
5.	*	
6.	*	
7.	*	
8.	*	
9.	*	
10.	*	