

MATHEMATICS (updated 6/27/09)

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UIL Test Comments — 2008-09

SAC - - - > (see Off on a Tangent)

(NOTE: If you were unable to attend one of the Student Activity Conferences this past Fall, you will want to read the SPECIAL SAC NOTE in the Off on a Tangent section)

- A** - - - > #27 – R, S, & T cannot be distinct digits in base 2 since 0 and 1 are the only digits in base 2. The question would be better stated as, “If R, S, and T represent digits then ...”
#37 – Answer should be D. The points of intersection are (0, π), (-1, π), (-3, π)
#40 – Since only two points on the parabola are marked, one must assume another point such as the vertex by looking at the graph. Even though the problem is doable by looking at the graph, I will try to remember to mark three points in the future.
- B** - - - > #11 – The word “annual” is missing. It should read ... annual interest rate.
#21 – This problem has two issues. It should say decreasing not increasing and the answer should be B not A.
#30 – There are two possible answers. If you consider the passenger boarding the ride at the bottom then E is the correct answer, however if the passenger can be anywhere then B would work as well.
#55 – The correct answer should be 12, choice (B), not 11 choice (A).
#60 – Answer choice C should be 438 units² not cubed.

District 1 - - - > #6 – There are two correct answers, (A) & (B)

District 2 - - - > No errors or corrections -- See below for discussion on #32

Regional - - - > No errors or corrections -- See below for discussion on #10

State - - - > #40 – Typo on the key. Answer should be E

TMSCA Test Comments — 2008-09 (tests I write for TMSCA)

6 - - - > #60 -- has two answers (A) & (C)

13 - - - > #26 – see the discussion in Off on a Tangent

#30 – answer choice E should be (7, 16), not (7, 14)

#49 – I left off an important part of the problem. The problem should read:

The figure shown is an isosceles trapezoid. Point E is the midpoint of segment AD and points C, D, and E form an equilateral triangle. Draw a line segment connecting points A and C. Find $m\angle ACB$.

#53 – answer choice A should be $\frac{4}{5}$, not $\frac{2}{3}$

State - - - > No errors or corrections reported

Canton Test Comments — 2008-09 (tests I write for Canton)

Fall Invitational - - - > No errors or corrections reported

Spring Invitational - - - > # 7 -- The answer should have been 1152

32 – The answer should have been 10

35 – The questions should have stated that half of the boys wear glasses and half of the girls wear glasses. This would have removed the issue of a possible assumption.

Off on a Tangent

Special Student Activity Conference (SAC) information →

Number Sense Session:

This session will be a little different from the past years. There will be a short summary of the contest followed by a Q&A period for any questions students or coaches might have about the contest. (A handout with information, resources, and helpful hints will be available for those beginning coaches who need this information.) After the Q&A, the students will take the 10 minute 2008 SAC test then grade it. The remainder of the time will be spent going over the test and discussing new problems and/or approaches to old problems for the upcoming season.

Mathematics Session:

This session will be a little different from the past years. There will be a short summary of the contest followed by a Q&A period for any questions students or coaches might have about the contest. (A handout with information, resources, and helpful hints will be available for those beginning coaches who need this information.) After the Q&A, the students will take the 20 minute 2008 SAC test then grade it. The remainder of the time will be spent going over the test and discussing new problems and/or approaches to old problems for the upcoming season. (see Article 1 below)

Special Session:

Math and Number Sense problems -- some oldies, but goodies, and newbies will be discussed
Special Topics – special sequences and patterns (Fibonacci, Lucas, etc.)

See you at one of the SACs (2008 Dates)

Sept. 20 – Tyler Junior College, Tyler
Oct. 4 – University of Texas, AUSTIN

Oct. 18 – West Texas A&M University, Canyon
Nov. 1 – A&M UNIVERSITY, Corpus Christi

Article 1. NEW QUESTIONS & APPROACHES -- 2008-09 MATHEMATICS CONTEST

1) **Mathematicians:** 6 names are being added to last year's list bringing the list to 21 people. Emphasis this year will be on female mathematicians. The new 6 are:

Theano, Alicia Stott, Karen E. Smith, Freda Porter, Emmy Noether, and Grace Alele Williams.

2) **MEANS:** special approaches to arithmetic, geometric, harmonic, and quadratic means.

3) **Spatial Views:** top view, bottom view, side views, etc. and other types of spatial relations.

4) **The quadratic equation $Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$:** The questions in this area will continue to include graph identification, the angle of rotation about the origin, and the rotation of points about the origin. This year students will also be asked to use the angle of rotation to find equations in standard form containing no xy term.

SPECIAL SAC NOTE →

The special session at the SAC's this last Fall included a presentation on the new questions and approaches for this year's math tests, a neat discussion on the Fibonacci and Lucas sequences, and a

discussion on Pascal's triangle.

If you would like any of this information email me and I will send it to you.

TMSCA #13 Math Test – problem #26

I overlooked the 84, 85, 91, 100, 100 sequence of scores which fits the parameters of the problem, but would give a mode of 100.

I only saw the sequence 84, 91, 91, 95, 100 that fit the criteria, hence I stated the problem as "Find the mode."

Had I seen both of the sequences I would have stated the problem as "Which of the following *could* be the mode?" instead of "Find the mode" or I would have stated some different criteria.

Fortunately, there was only one answer choice given that fit the criteria.

District 2 Math Test – problem #32

UIL was contacted by a coach on Saturday afternoon of the district 2 week concerning this problem.

UIL contacted me to address the problem. I contacted the coach, we discussed the problem, and I made my decision to keep the answer to problem #32 as letter C. I informed UIL of my decision which was relayed to a few other schools that called UIL for a ruling later that afternoon.

Since the completion of the district 2 week, UIL and I have received a few emails and phone calls asking for an explanation about #32. So, here it is.

The coach that I contacted told me that their coaches/graders had agreed that C was the correct answer during the grading process. It was during the verification period that a few students brought up the issue of D & E in their interpretation of the problem. The coach did the correct thing by contacting UIL and having me call the coach to discuss the problem.

Here is how I tried to explain my decision to the coach who had called.

The first sentence, in my mind, is the key to the problem. It states that the given equation has two imaginary roots. Hence all values of k must be greater than $4/3$. The second statement is where the apparent interpretation issue takes place. "Which of the following is always a true statement about the value of k ." Based on the statement of the first sentence the only values of k that can be considered are those greater than $4/3$. The only answer choice given that has all values of k greater than $4/3$ is letter C where $k > 2$. This is the basis of my decision to keep C as the correct answer.

I have been looking at the problem this week and I understand why these students interpreted it the way they did. If $k > 4/3$ then k is always greater than 0 or greater than 1. I certainly don't disagree with that and I can see why they thought it should be D or E.

Looking at the problem from several directions this week it is obvious that the problem, as written, brings in some ambiguous interpretations and needs to be rewritten.

I am always open to discussion and willing to listen to your justifications when considering the changing of the key or the removal of a problem. In the end, I have to make my decision. I know some of you disagree with my decision and some do not disagree, but it is the decision I made, be it right or be it wrong.

I do want to remind all of you that you need to contact UIL, who will contact me, about any issues like these to make sure that I make a decision as to whether a change in the key is permissible. The changing of the key or removal of a problem without UIL permission skews the results, especially as far as the wild card team is concerned. If one district changes a problem or a key and others do not, then the "fair playing field" has been altered.

Finally, I work hard, as do those who proof my tests, to try to remove ambiguity, alleviate misinterpretations, and provide correct answers to correctly stated problems. Do we make mistakes? Yes, but I believe we have done an excellent job in keeping these issues at a bare minimum.

Regional Math Test – problem #10

I had an interesting discussion with a coach concerning the phase shift being $-\pi/3$ and not $\pi/3$. I do not disagree that, we as teachers tell our students that the phase shift is $-c/b$ or c/b depending on which

way the horizontal shift is. A horizontal or vertical translation requires a distance and a direction. The graph of a function, $f(x-h)$ can be obtained by translating the graph of $f(x)$ horizontally by $|h|$ units. Hence, if h is positive then the translation is to the right and if h is negative then the translation is to the left. With this in mind, the value of h is the number of units translated and the sign is the direction it is to be moved h units. Problem #10 asked, "Which of the following has a value of $\pi/3$?" So, $\pi/3$ is the number of units translated horizontally which is called the phase shift. The direction was not part of the problem. Had I asked what the phase shift of the $f(x)$ was then the answer would have had to include the units translated and a direction (i.e. $-\pi/3$ or $\pi/3$ to the left).

Good Luck! Work Hard! Play Fair! I am off on another tangent ...