Naples High School Regional Competition

Interschool Test

Solution Sheet

Have Fun!

6	**4**	*9*	*3*	**5**	*7*	*8*	**1**	**2**
2	*5*	*7*	*1*	*8*	*6*	*9*	*3*	**4**
8	*1*	**3**	*4*	*9*	*2*	**5**	*6*	*7*
5	*2*	*1*	**7**	*6*	**3**	*4*	*8*	*9*
9	*7*	*8*	*5*	**4**	*1*	*6*	*2*	**3**
4	*3*	*6*	**8**	*2*	**9**	*1*	*7*	*5*
3	*8*	**5**	*6*	*7*	*4*	**2**	*9*	*1*
1	*9*	*4*	*2*	*3*	*8*	*7*	*5*	**6**
7	**6**	*2*	*9*	**1**	*5*	*3*	**4**	**8**

Math-ish

1. **19** x = 4, so d/dx is 4x+3, which is 19.

2. **1/44** She has 3 dogs, 8 reptiles, and 1 sibling, so there are 12 marbles, 3 red, 8 black, and 1 white. Therefore, the probability of drawing a red marble and then a white marble is 3/12 * 1/11, which is 1/4 * 1/11, which is 1/44.

3. **0.00** Alex has no baritones to help him in symphonic band, therefore the answer is 0.00.

4. **Biscayne** All other words can be formed with the sound of individual letter. For example, the first words are M-N-M, O-P-M, M-T, and O-K. Biscayne doesn't work.

5. **687.5** x=5. The Millennium Falcon was shown in episode 4, 5, and 6, and was also shown in episode 2 when the cargo ship landed at Theed and in episode 3 when the transport with Obi-Wan, Palpatine, and Anakin arrives at Coruscant. Therefore, the integral x^3 + 7x^2 +40x, from 0 to 5, which is 687.5.

6. **4.5250 * 10^ -14 parsecs / second**
1/y = tan x
y = 1/tan x = cos x/sin x

dy/dt = [(cos x)'sin x - (sin x)'cos x] / sin^2 x
= (-sin^2 x - cos^2 x)(dx/dt) / sin^2 x
= -(dx/dt) / sin^2 x

at x = pi/3, and dx/dt = -pi/3
dy/dt = -(-pi/3) / [sin^2 (pi/3)]
= pi / 3(sqrt(3)/2)^2
= 4pi/9 km/min.
A parsec is 3.08568025 × 10^16 meters, which is 3.08568025 X 10^13 km. Therefore, the answer is 4pi/9 km/min * (1 parsec / 3.08568025 * 10^13 km), which is 4.5249776 × 10^-14 parsecs/second.

7. **1764** A = 7, B = 7, C = 126.

8. **However many the Party says (or "four or five")** The question is related to 1984

9. **189,819 letters** The word is a chemical word not found in the dictionary. It is abbreviated to Methionylthreonylthreonyl...isoleucine.

10. **10**

Each locker has its locked status reversed once for every divisor that it has -- so locker #14, for instance, has that happened on day 1, 2, 7, and 14. Most positive integers have an even number of divisors, since if N is divisible by M, it's also divisible by N/M; the divisors thus form pairs (M, N/M), so for 14 the pairs are (1,14) and (2,7).

But squares have an odd number of divisors, since in one of these pairs the numbers are equal -- thus, 16 is divisible by the pairs (1,16), (2,8), and (4,4), for a total of 5 divisors. There are 10 squares between 1 and 100.

Many people think the answer will likely have something to do with the number of primes; I did at first. But that's not so -- primes have even numbers of divisors just like most numbers, to be precise 2 divisors.

(Note: "Most positive integers" here is shorthand for "most positive integers on any given interval 1 to N where N is 5 or more." Technically, there are as many squares as there are positive integer nonsquares, as many positive integers divisible by a million as there are positive integers, as many primes as there are nonprimes, and so on. But that is a story for another day.)

11. **479,001,600** A is 10, B is 5, C is 8, and D is 6.

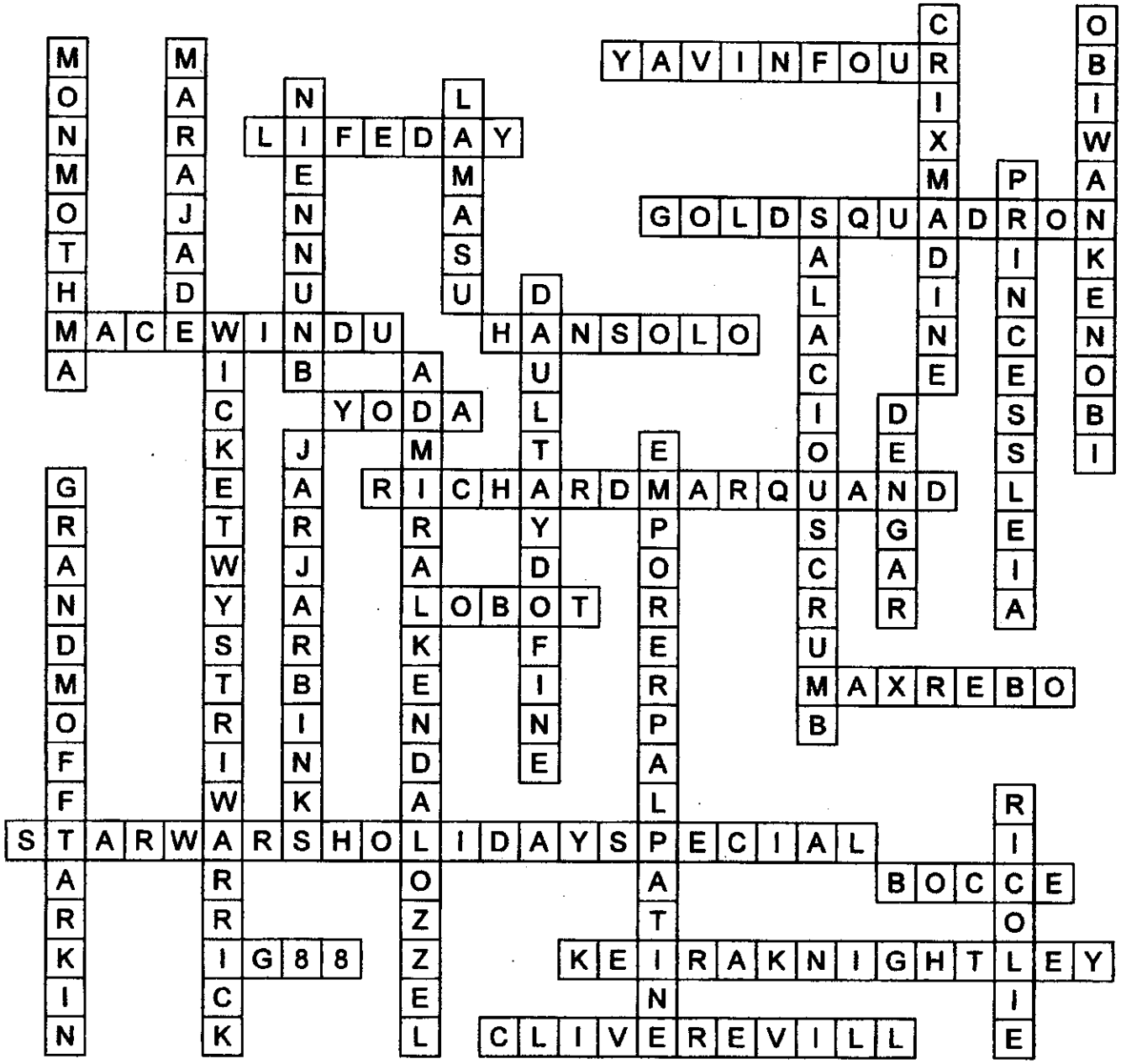
12. **6.28748 * 10^33** x is 30, y is 1, A is 3 (pie), B is 640.

13. **1160 or 1.16 * 10 ^ 3** A= 45, B= 24 (year 1896), C= 9 (year 1969)

X= (45/24) * 9! = 680400Y= (45 + 5)/5 + 24 = 34

(680400 * 34)/(680400 + 34) = 34.0

May the Force Be with You!



Outdoor Escape

1. **6080/3=2026.6667**

   Minimum size limit for Red Grouper = 20
   Bag limit for Mangrove Snapper = 5

2. **8,815,966,846,080**

   Grouper Aggregate = 5
   Tripletail min. size limit = 15

3. **(+/-) 4**

   Bag limit for quail = 12
   Deer bag limit = 2
   King Mackerel bag limit = 2

4. **5/6**

   Pinus = 5 letters
   Lobster bag limit = 6

5. **220**

   10 square chains per acre
   Min. size for Black grouper = 22

6. **2140**

   Largest Tiger Shark = 1,065 lbs.

7. **3628800**

   Largest Weakfish = 10 lbs.

8. **77**

   Epinephelus = 11 letters
   66 feet in a chain

Quick Outdoor Trivia

9. **Nassau Grouper, Yellowfin Grouper, Swordfish, and Little Tunny**

10. **Dry Tortugas, Fort Jefferson**

Mixed

Miller's ROCK and ROLL TRIVIA:

1. **Nine Inch Nails**
2. ***A Night at the Opera* and *A Day at the Races***
3. **Boyz II Men**
4. **Scorpions**
5. **1982**
6. **The Searchers**

OFFICER QUESTIONS:

1. **Duchess**
2. **Sheriff Bart**
3. **Aquatics**
4. **Skipper (or Daniel), President**
5. **Brooke, Secretary**

(for these questions you must find one of the following officers, which will have their position on the sleeve of their shirt: President, Vice President, Secretary, Treasurer, or Spirit Leader)

FOOTBALL:

1. **The Golden Girls**
2. **The fewest points allowed by defense and the most points scored by an offense**
3. **Dedo**

COUNTRIES:

*Identify the country in which the three cities, towns, villages, or equivalent are found

1. **Azerbaijan**

2. **Brunei**

3. **Burkina Faso**

4. **Sierra Leone**

5. **Liechtenstein**

6. **Maldives**

7. **Mauritania**

8. **Sao Tome/ Principe**

9. **Tajikistan**

10. **Mauritius**

MOVIES:
*Identify the movie, which has the three characters

1. **The Dark Crystal**

2. **The Great Mouse Detective**

3. **Once Upon a Forest**

4. **The Princess and the Goblin**

5. **The Three Caballeros**

6. **Fern Gully**

7. **Bedknobs and Broomsticks**

8. **The Pebble and the Penguin**

9. **The Secret of Nimh**

FOREIGN LANGUAGE:
*Determine which language these sentences are written in and then translate the sentences

1.a. **Polish**

1.b. **I like to dance the polka.**

2.a. **Macedonian**

2.b. **Alexander of Macedonia was great and extraordinary.**