

FROSHMORE MATH

# Round Two

Read only for Round Two

## Officials Checklist and reminders:

- 1.) Review this checklist and reminders document and the rules flow chart. \_\_\_\_\_
- 2.) Pencils and fresh scratch paper for each participant \_\_\_\_\_
- 3.) Timer instructions \_\_\_\_\_
- 4.) Identify the head coach for each team. \_\_\_\_\_
- 5.) Identify the team captain. \_\_\_\_\_
- 6.) Review the pumpnickel rule \_\_\_\_\_

Accept only the answer to the bonus question that comes from the captain.

The captain may defer to another team member to give the answer to the bonus question.

If you want them to indicate a deferral in a specific way – tell them at the beginning of the match. “If you are going to defer on a bonus question, please do so by ....”

**Coaches may use an ipad or table to keep score (I've sent out an excel score sheet) They may not use their ipad, phone or other technology to look up answers, send or received text messages or emails or to make calls during competition.**

Before you begin, remind students that on a toss-up question they must buzz-in and be recognized before giving the answer and that they may NOT confer on a toss-up. You may only confer on a bonus question.”

When you read a toss-up question – identify the subject, then read the question.

If the team member buzzes-in before the question is completed and the answer is incorrect, say ‘incorrect, I will finish the question’ then finish reading the question.

If you have finished reading the question when the first team buzzes-in and gives an incorrect response say ‘incorrect,’ look at the second team call them by team name and say ‘\_\_\_\_\_ I have finished the question’

If the time has expired, their response should be to immediately buzz-in to be recognized. If there is still time (5 seconds for a regular question 15 on a math computation) they have the remaining time to buzz.

If the toss-up question is not answered correctly by either team, give the correct answer. Do NOT read the bonus question, go on to the next toss-up. **If you need a replacement question for this subject,**

**you may use the unused bonus.**

The first time you read a bonus question for each team say ‘Here is your bonus question, you do not need to buzz-in. Remember you may confer on this question, and I will take the answer from the team captain.’

There is NOT a penalty for buzzing during a bonus question.

**When the time for conferring has expired** (10 seconds – 15 on math or science computation) **call for the answer.** Say, ‘Captain?’ or ‘answer please’ (or something similar). If they do not give you an immediate answer say ‘time’ and give the correct answer.

There is no limit to the number of team members a team substitutes.

On a toss-up question, do not give the correct response until you have given both teams an opportunity to answer the question.

Leading articles such as “the,” “an,” and “a” are not required (e.g., Tale of Two Cities is an acceptable answer for The Tale of Two Cities). However, if an article is given, it must be the correct one.

Plural/Singular answers are acceptable unless otherwise delineated.

Last names are acceptable, except where there is more than one common person in the same field.

Prompt for more information by saying – ‘more’ or ‘more specific’.

**Questions requiring additional computation time (15 seconds) have computation in the subject line - MATH COMPUTATION: or SCIENCE COMPUTATION: or BONUS COMPUTATION:** (If it needs it and we forgot it, add it!)

**Math or Science questions that do not require computation and receive regular question time (5 for toss-up and 10 for bonus) do not have computation in the subject line - MATH: or SCIENCE: or BONUS**

Explain the addition of the word Computation to the timer and the team at the beginning of the tournament. After the first question containing COMPUTATION: You may choose to say only Computation if you wish.

Give your stall count before the game starts. A stall count is the amount of time allowed for the student to begin their answer once you've called on them. "My stall count is \_ \_ \_." Fill in the blanks with your count. Do you count 1, 2, stall? 1, 2, 3, stall? Do you say stall on the upbeat of the 3rd second or the downbeat? My preference is you count 1(1001), 2(1002), 3(1003) with stall being called on the downbeat of 3. (Down beat being the end of the 1003 with 100stall. You do not have to say the 1000 or the second 1, 2 or 3 out loud. You do need to make some type of physical indication - head nod, hand count (like a basketball referee counting the backcourt) even a foot tap. But do something so the student can see the seconds slipping away. This also helps with consistency. Neither team can say the other team received more time before a stall was called. When an immediate answer is expected 1 second is adequate time to allow before a stall is called.

"Welcome to Round One of the tournament. I am \_\_\_\_\_, your moderator. (if you have a judge, timer and scorekeeper, introduce them as well) Our two teams are \_\_\_\_\_ and \_\_\_\_\_. Head coaches, will you please stand. A protest may be lodged only by the head coach." (run a buzzer check) "Students, remember, you may not give an answer until you are recognized. If you do so, it will be ruled as an incorrect response, even if your answer is correct. Explain the timing for Math or Science Computation: (see instructions) Good sportsmanship is expected from **all** players, substitutes, coaches, spectators and parents. Except for using the excel spreadsheet to keep score, you may not use computers, smart phones, iPad, etc. during the competition. Turn off all and put away all electronics at this time. (pause) Are there any questions? Let's begin."

- \_\_\_\_\_ 1. MATH COMPUTATION: The legs of a right triangle are 21 and 28 inches long. How long, in inches, is the length of the hypotenuse of this right triangle?

ANSWER: **35** (inches)

BONUS BONUS COMPUTATION: The hypotenuse of a right triangle is 50 inches long. If one leg is 48 inches long, what is the perimeter of the right triangle in inches?

ANSWER: **112** (inches) [right triangle: 50,48,14 which is 25,24,7 triple x 2;  
50+48+14=112]

- \_\_\_\_\_ 2. SOCIAL STUDIES: **A leader of this country built over 170,000 bunkers during his reign, most of which was allied with Maoist China. A national hero of this country won the Siege of Kruje and is called \* Skanderbeg.** Enver Hoxha led what country governed from Tirana?

ANSWER: **Albania**

BONUS BONUS: The de-Communization of Albania was accelerated by the execution of Nicolae Ceausescu in what nearby country?

ANSWER: **Romania**

- \_\_\_\_\_ 3. CURRENT EVENTS/POP CULTURE: **He served in the House of Representatives from 1987 until his death in 2020. Now he's featured on a US postage\* stamp.** Name the man who was also an original member of the Freedom Riders.

ANSWER: **John Lewis**

BONUS BONUS: Lewis and his fellow protestors were attacked during a civil rights march in which US state?

ANSWER: **Alabama**

- \_\_\_\_\_ 4. MATH COMPUTATION: Divide  $5\frac{2}{3}$  [five and two-thirds] by  $\frac{5}{9}$  [five-ninths] and give answer as a mixed number in simplest form.

ANSWER: **10  $\frac{1}{5}$**  [ten and one-fifth]

BONUS BONUS COMPUTATION: Subtract  $6\frac{7}{8}$  [six and seven-eighths] from  $16\frac{3}{4}$  [sixteen and three-fourths]. Leave answer as a mixed number in simplest form.

ANSWER: **9  $\frac{7}{8}$**  [Nine and seven-eighths]

- \_\_\_\_\_ 5. HUMANITIES: In Cherokee myth, this action was performed by Grandmother Spider. Many Pacific Northwest mythologies believe the Coyote performed this action, which was performed in Polynesian mythology by \* Maui. In Greek mythology, Prometheus performed what action?

ANSWER: **Stealing Fire** [accept any obvious equivalents for giving fire to humanity]

BONUS BONUS: In both Yukon mythology and many Australian aboriginal mythologies, fire was stolen by a God in the form of what corvid?

ANSWER: **Crow**

- \_\_\_\_\_ 6. MATH COMPUTATION: Bob's Bike Shop bought a mountain bike for \$180 and sold it for \$288. What was the percent markup on the bike?

ANSWER: **60 (%)**

BONUS BONUS COMPUTATION: Bob's Bike Shop salesmen make a 6.5% commission on each sale. How much did the salesman make on the \$288 sale?

ANSWER: **\$18.72**

END OF FIRST QUARTER

*The score at the end of the first quarter is*  
Team one \_\_\_\_\_ Team two \_\_\_\_\_

*Are there any questions?*

(pause and look at the coaches if there are no protests proceed)

*"Coaches... you may substitute if you wish."*

- \_\_\_\_\_ 7. SCIENCE (calculation): Bill's heart pumps about 65 milliliters of blood per beat, and it beats approximately 75 times per minute when he is resting. Calculate the volume of blood pumped in liters per day, considering a 24-hour period. Remember not to make your ANSWER more precise than the data.

ANSWER: 7,000 L

BONUS BONUS: During a normal school day, going between classes, lunch, and football practice increase Bill's average heart rate by 20%. What will the new daily volume be?

ANSWER: 8,400 L

- \_\_\_\_\_ 8. MATH COMPUTATION: Multiply the ordinal number of the present president times the number of members of the U.S. Supreme Court. What is the result?

ANSWER: **414** [46 x 9 = 414]

BONUS BONUS COMPUTATION: Take the numerical street address of the White House and find its square root.

ANSWER: **40** [Street address of the White House is 1600 Pennsylvania Avenue, so SQ RT 1600 = 40]

- \_\_\_\_\_ 9. LITERATURE: In this spinoff novel, Grayson and Jameson are drawn into twisted games\* from opposite sides of the globe. They are helped by their brothers and the girl who inherited their grandfather's fortune. Name the newest installment of the *Inheritance Games* series, released in 2023.

ANSWER: **The Brothers Hawthorne**

BONUS BONUS: Who wrote the *Inheritance Games* series?

ANSWER: **Jennifer Lynn Barnes**

- \_\_\_\_\_ 10. MATH COMPUTATION: How many days in decade with two leap years included?

ANSWER: **3,652** [365 x 10 + 2 = 3652]

BONUS BONUS COMPUTATION: How many decades are there in a sesquicentennial?

ANSWER: **15** [150 / 10 = 15]

- \_\_\_\_\_ 11. SOCIAL STUDIES: This man's name is Chiricahua for "The One Who Yawns." This man's namesake campaigns were the last large-scale engagements of the \* Apache Wars. Who is this Apache Leader who frequently escaped his imprisonment at Fort Sill?

ANSWER: **Geronimo**

BONUS BONUS: After the Geronimo campaign, many Apache children were forcibly removed from their families and taken to the Carlisle Indian Industrial School in what US state?

ANSWER: **Pennsylvania**

- \_\_\_\_\_ 12. MATH COMPUTATION: What is the slope of a line through the points (-6, 2) [READ Negative Six comma two] and (0, 11) [READ zero comma eleven]?

ANSWER: **3/2** [9/6 = 3/2; Three Halves or one and one-half or one point five]

BONUS BONUS COMPUTATION: Given the line with the slope just calculated [3/2], what is the equation of a line, in slope intercept form, of a line perpendicular to that line and passing through the point (0,3) [READ zero comma three]

ANSWER: **y = -2/3x + 3** [Perpendicular slope is -2/3, y-intercept is 3 so "y = negative two-thirds x plus three"]

END OF FIRST HALF

*The score at the end of the first half is*

*Team one \_\_\_\_\_ Team two \_\_\_\_\_*

*Are there any questions?*

(pause and look at the coaches if there are no protests proceed)

*"Coaches... you may substitute if you wish."*

- \_\_\_\_\_ 13. SCIENCE (calculation): A solar panel with an area of 2.5 square meters receives sunlight with an average intensity of 800 watts per square meter. What is the total power input to the solar panel in watts?

ANSWER: 2000 watts

- BONUS BONUS: If the solar panel can effectively function for 9 hours per day, how many Kilojoules of electricity could it theoretically produce? State your ANSWER with two significant digits.

ANSWER: 65,000 kJ

- \_\_\_\_\_ 14. FINE ARTS: **This artist painted a woman sitting alone drinking a coffee in his *Automat*, while another of his paintings shows two women in conversation in a cafe and is called \* *Chop Suey*.** An ad for 5 cent Phillies Cigars shows over a diner in what artist's *Nighthawks*?

ANSWER: (Edward) Hopper

- BONUS BONUS: What painting by Hopper depicts a near empty movie theater with a lone woman standing under a light on the right side of the painting?

ANSWER: New York Movie

- \_\_\_\_\_ 15. MATH COMPUTATION: What is the probability, as a fraction in lowest terms, of rolling two dice and obtaining a nine?

ANSWER: **1/9** [Four over thirty-six = 1/9]

- BONUS BONUS COMPUTATION: Playing with a standard deck of 52 cards, a poker hand has a ten, jack, queen, and king of Diamonds. A flush is a poker hand with all cards of the same suit. What is the probability, as a fraction in lowest terms, of the fifth card making this hand a flush?

ANSWER: **3/16** [There are nine Diamonds left in the deck; 48 cards left to pick from;  $9/48 = 3/16$ ]

- \_\_\_\_\_ 16. FINE ARTS: ***The Plate Mansion* and *The Laughing Hannya* are prints from this artist's *One Hundred Ghost Stories* series. Another series by this artist includes *Storm Beneath the Summit* and \* *Fine Wind, Clear Morning*.** What Japanese artist's *Great Wave off Kanagawa* is part of his *Thirty Six Views of Mount Fuji*?

ANSWER: (Katsushika) Hokusai [accept names in either order, but Hokusai is required]

- BONUS BONUS: Hokusai was a prominent figure in what Japanese art movement whose name means, "Pictures of the Floating World?"

ANSWER: Ukiyo-e

- \_\_\_\_\_ 17. MATH: What is term for a polygon with all sides congruent and all angles congruent?

ANSWER: **Regular**

- BONUS BONUS: What is the name of a polyhedron with 12 faces that are all regular pentagons?

ANSWER: **Dodecahedron** [doe deck uh HE drun]

18. SOCIAL STUDIES: **This country's independence was recognized in the Evian Accords. This country's civil war is also known as the Black Decade, and this country was home to the \* pied-noir.** What is this North African country which gained independence from France in 1962?

ANSWER: (People's Democratic Republic of) Algeria

BONUS BONUS: In 2011, Algeria saw political unrest as part of what large-scale protest movement across the Middle East?

ANSWER: Arab Spring

END OF THIRD QUARTER

*The score at the end of the third quarter is  
Team one \_\_\_\_\_ Team two \_\_\_\_\_*

*Are there any questions?*

(pause and look at the coaches if there are no protests proceed)

*"Coaches... you may substitute if you wish*

19. MATH COMPUTATION: What is the value of six factorial plus three factorial plus one factorial?

ANSWER: **727** [6 factorial is 720, three factorial is 6, one factorial is 1, 720+6+1 = 727]

BONUS BONUS COMPUTATION: What is the Roman Numeral for 727?

ANSWER: D C C X X V I I

20. SCIENCE (calculation): A rock layer is dated by analyzing trapped crystals by radiometric dating. The ratio of parent material to daughter material shows that 12.5% of the parent material remains. If it has a half-life of 40 million years, how much time has passed since the crystals formed?

ANSWER: 120 million years.

BONUS BONUS: A rock layer is dated by analyzing trapped crystals by radiometric dating. If the amount of parent material remaining is 93.75% and the parent material has a half-life of 800 million years, how much time has passed since the crystals formed?

ANSWER: 750 million years

21. CURRENT EVENTS/POP CULTURE: **The Supreme Court struck down this college admissions\* policy.** The high court said this race-based admissions policy is US colleges and universities is unconstitutional. Name the policy that is an effort to improve educational opportunities for members of minority groups.

ANSWER: affirmative action

BONUS BONUS: The Chief Justice said that students should be treated based on their experiences as an individual. Name him.

ANSWER: John Roberts

- \_\_\_\_\_ 22. MATH COMPUTATION: Billy went to sleep at 8:27 pm and woke up the next morning at 6:18 am. How long did he sleep in hours and minutes?

ANSWER: **9 hours, 51 minutes**

- BONUS BONUS COMPUTATION: If 9 hours and 51 minutes was the average length of sleep he got for an entire week, how many days, hours, and minutes did he sleep during that week?

ANSWER: **2 days, 20 hours, 57 minutes**

- \_\_\_\_\_ 23. SOCIAL STUDIES: **This man's administration faced the Travelgate scandal. As president, this man signed Don't Ask Don't Tell, and The Defence of Marriage Act. What former \* Governor of Arkansas faced the Lewinsky Scandal and was the 42nd US President?**

ANSWER: (Bill) Clinton

- BONUS BONUS: What Tennessee politician served as Clinton's Vice President? He later ran against and lost to George W. Bush in the 2000 presidential election.

ANSWER: (Al) Gore

- \_\_\_\_\_ 24. SCIENCE (calculation): The distance from Earth to the Moon is approximately 385,000 kilometers. Light travels at a speed of  $3.00 \times 10^8$  meters per second. If a laser is fired at a reflector on the moon and bounces back to Earth, how long, in seconds, does the round trip take? Use the correct number of significant digits.

ANSWER: 2.57 s

- BONUS BONUS: If it takes 20 minutes and 39 seconds for a signal to reach Mars from Earth, what is Mars's current distance, in kilometers, from the Earth? This distance was accurate to four significant digits as of midnight August 31, 2023.

ANSWER: 371,700,000 kilometers [ $3.717 \times 10^8$  km]

END OF GAME

*The score at the end of the game is*

*Team one* \_\_\_\_\_

*Team two* \_\_\_\_\_

If there is a tie allow for substitution before you ask the tie-breaker questions.

**Tie Breakers**

MATH COMPUTATION: An intercepted arc formed by a tangent line and a radius intersecting at the point of tangency has a measure of 162 degrees. What is the measure in degrees of the acute angle formed?

ANSWER: **81** (degrees)

MATH COMPUTATION: Simplify the expression  $3a^5b^8$  times  $17a^2b$ .

[READ three a to the fifth, b to the eighth, times

seventeen a squared, b]

ANSWER:  **$51a^7b^9$**  [fifty-one a to the seventh (power), b to the ninth (power)]

MATH COMPUTATION: Convert  $7\pi/12$  radians into degrees.



ANSWER: **105** (degrees)

MATH: What is the term for two angles whose sum is equivalent to the measure of an angle formed by perpendicular lines?

ANSWER: **Complementary**

MATH COMPUTATION: What is the permutation of twenty objects taken two at a time?

ANSWER: **380** [20 x 19]

***Are there any questions?*** ( pause and look at the coaches if there are no protests proceed)  
***This ends the game. "***