FROSHMORE MATH

Round One

Read only for Round One

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 pumpernickel 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 odds that the Thunder will beat the Spurs is nine to eleven. What is the probability, as a percent, that the Thunder lose to the Spurs?

ANSWER: **55** (%)

BONUS BONUS COMPUTATION: If the odds that the Thunder will win any basketball game they play are nine to eleven, how many games, to the nearest whole number, would they win if they play 82 games?

ANSWER: **37**

_____ _____ 2. CURRENT EVENTS/POP CULTURE: **Hundreds of newspapers pulled this comic*** strip. Its creator Scott Adams made racist remarks during a YouTube live stream. Name the decades-long running strip that features a white-collar, micromanaged office worker.

ANSWER: **Dilbert**

BONUS BONUS: Which Jeff Bezos owned newspaper canceled Dilbert?

ANSWER: **Washington Post**

_____ _____ 3. SOCIAL STUDIES: **The mural *My God, Help Me to Survive This Deadly Love* was painted on this structure. This structure was destroyed after a mistaken message that an immigration policy would change *** immediately. What is this structure, which was crossed by Checkpoint Charlie?

ANSWER: **Berlin Wall**

BONUS BONUS: *My God, Help Me to Survive This Deadly Love* features a kiss between Erich Hoenecker and what Soviet premier who succeeded Nikita Khrushchev?

ANSWER: (Leonid) **Brezhnev**

_____ _____ 4. MATH: What C term completes this Geometry theorem: All vertical angles are ?

ANSWER: **Congruent**

BONUS BONUS: In a right triangle with an altitude drawn from the right angle vertex to the hypotenuse, what are the two-words describing the relationship between the altitude and the lengths of the hypotenuse formed by the altitude? The first word begins with G.

ANSWER: **Geometric Mean**

_____ _____ 5. SCIENCE (calculation): How many moles of oxygen atoms are there in a 3.50 mole sample of carbon dioxide? Remember that the formula for carbon dioxide is CO_2.

ANSWER: 7 moles

BONUS BONUS: If 2.5 moles of methane react with unlimited oxygen from the atmosphere, how many moles of carbon dioxide will be produced? Remember that the formula for Methane is CH_4.

ANSWER: 2.5 moles

_____ _____ 6. HUMANITIES: **One work by this author was written in honor of a translation of the works of Homer by George Chapman. "I have been half in love with easeful death" is a line from another of this poet's *** odes, his "Ode to a Nightingale." What English poet wrote, "Beauty is truth, truth beauty?"

ANSWER: (John) **Keats**

BONUS BONUS: The line, "Beauty is truth, truth beauty" appears in what ode by Keats?

ANSWER: **Ode on a Grecian Urn**

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. MATH COMPUTATION: What is the area, in square <u>feet</u>, of a triangle with a base of 2 <u>yards</u> and an altitude of 5 <u>feet</u>?

ANSWER: **15** (square feet)

BONUS BONUS COMPUTATION: What is the area, in square centimeters, of a regular decagon with an apothem of 6.2 centimeters and a side of 4 centimeters?

ANSWER: **124** (square cm)

_____ _____ 8. SOCIAL STUDIES: **This dynasty's collapse preceded the Three Kingdoms period. This dynasty barely survived the *** Yellow Turban Rebellion. What is this Chinese dynasty which shares its name with China's majority ethnic group?

ANSWER: **Han** (Dynasty)

BONUS BONUS: What Naval battle established the borders of the Three Kingdoms period with the defeat of Cao Cao in 208 AD on the Yangtze River?

ANSWER: (Battle of) **Red Cliffs** [also accept Battle of Chibi]

_____ _____ 9. MATH COMPUTATION: Write three hundred seven billion in correct scientific notation.

ANSWER: **3.07 x 10¹¹**   [three point zero seven times 10 to the 11th (power)]

BONUS BONUS COMPUTATION: Give the correct scientific notation for fifty ten-millionths.

ANSWER: **5.0 x 10⁻⁵**   [five point <u>zero</u> times ten to the negative five (power) MUST SAY ZERO]

_____ _____ 10. LITERATURE: **It's one of the most fundamental dramatic devices used by Shakespeare*** in his dramas. It is a time when the character voices his inner thoughts aloud. What is a monologue that captures a character talking to himself at length out loud?

ANSWER: <u>**soliloquy**</u>

BONUS BONUS: From which famous Shakespearean tragedy does the _To Be, or not to be_ soliloquy take place?

ANSWER: <u>_**Hamlet**_</u>

_____ _____ 11. MATH COMPUTATION: How many pounds is equal to 344 ounces?

ANSWER: **21.5**   (pounds)

BONUS BONUS COMPUTATION: How many acres are in 24 sections?

ANSWER: **15,360**   (acres)

_____ _____ 12. SCIENCE (calculation): Doris carried a 25.0 kg case of copy paper to the copy room. The distance from the storeroom to the copy room is 20.0 m. How many Joules of work did Tiffany do moving the case of paper? You DO NOT need to express your ANSWER using the correct number of significant digits.

ANSWER: 500 J

BONUS BONUS: Express your previous ANSWER in the correct number of significant digits. One way to do so would be to use scientific notation.

ANSWER: 5.00×10^2 J or 500. J [the decimal point must be stated. Do not accept 500.0]

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. MATH COMPUTATION: Given this set of data: [READ SLOWLY] 24, 13, 9, 11, 13, 30, 25, 24, 22, 13, 21, 17.
What is the mode of this data?

ANSWER: **13**

BONUS BONUS COMPUTATION: What is the median for the set of data given?

ANSWER: **19**

_____ _____ 14. FINE ARTS: **This composer's last major work was the tone poem _Tapiola_. This composer's _Lemminkainen Suite_ adapted stories from the *** _Kalevala. The Karelia Suite_ and _Finlandia_ are works by what prominent Finnish composer?

ANSWER: (Jean) **Sibelius**

BONUS BONUS: Sibelius also wrote incidental music for what Shakespeare play about the sorcerer Prospero?

ANSWER: **The Tempest**

_____ _____ 15. MATH COMPUTATION: Solve for x: $x^2 - 256 = 0$

ANSWER: **16 and -16** [or **plus or minus sixteen**] (MUST HAVE BOTH ANSWERS)

BONUS BONUS COMPUTATION: Solve for x: $x^2 - 18 = 3x$

ANSWER: **-3 and 6** [may say 6 and -3; must have both answers]

_____ _____ 16. SOCIAL STUDIES: **This man survived a revolt of chariot-racing fans called the Nika Revolt. This man was served by the eunuch Narses and his reign saw the construction of the *** Hagia Sophia. Who is this Byzantine emperor who oversaw that empire at its territorial height?

ANSWER: **Justinian** (I) [also accept Justinian the Great]

BONUS BONUS: What former actress and prostitute was the wife of Justinian?

ANSWER: **Theodora**

_____ _____ 17. SCIENCE (calculation): Ethan is testing a simple machine in lab. For every 40.0 Joules of work he puts into the machine, he is able to get 18.0 joules of work done. What is the efficiency of Ethan's simple machine? Be sure to have the correct number of significant digits in your ANSWER.

ANSWER: 45.0%

BONUS BONUS: If Fiona improves the efficiency of Ethan's machine to 60.0% how many joules of work can she get out of that 40.0 J input?

ANSWER: 24.0 J

_____ _____ 18. MATH COMPUTATION: What is the value of Quantity seven times three times four, close quantity, to the zero power? $(7 \times 3 \times 4)^0$

ANSWER: **1**

BONUS   BONUS COMPUTATION: What is 125 to the negative one-third power?

ANSWER: **1/5**   [one-fifth]

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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

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_____ _____ 19. CURRENT EVENTS/POP CULTURE: **She won 12 Grammys and was a member of the Rock and Roll Hall of Fame before her death in 2023.*** She was born Anna Mae Bullock and later became known as the "Queen of Rock and Roll". Name the artist who performed *What's Love Got to Do With It?* and *We Don't Need Another Hero*.

ANSWER: **Tina __Turner__**

BONUS   BONUS: Turner became a citizen of this country in the early 2000s. Name this Central European country known for its banking, watches, and chocolate.

ANSWER: **__Switzerland__**

_____ _____ 20. MATH COMPUTATION: Simplify by adding like radicals: $\sqrt{8} + \sqrt{50}$
[READ square root of 8 plus square root of 50]

ANSWER: **$7\sqrt{2}$**   [Seven square root of two OR seven radical two]

BONUS COMPUTATION: Simplify by adding like radicals: $\sqrt[3]{54} + \sqrt[3]{128}$
BONUS   [say cube root of 54 plus cube root of 128]

ANSWER: **$7\sqrt[3]{2}$**   [seven cube root of two or seven times the cube root of two]

_____ _____ 21. HUMANITIES: **The founder of the Ghost Dance movement predicted that this event would occur in 1890. Charles Taze Russell predicted that this event would occur in 1874, while another failed prediction that this event would occur on October *** 22, 1844 was preached by William Miller. The Great Disappointment came from a failed prediction for what event?

ANSWER: **__Second Coming__** (of Jesus Christ) [also accept Second Advent; prompt on End of the World or Apocalypse or anything like that]

BONUS   BONUS: Charles Taze Russell founded a progenitor group of what religious denomination known for door-to-door preaching and not celebrating holidays such as Christmas, Halloween, and birthdays?

ANSWER: **__Jehovah's Witnesses__**

_____ _____ 22. MATH COMPUTATION: The volume of a cube is 343 cubic feet. What is the surface area of the same cube in square feet?

ANSWER: **294** (square feet)

BONUS BONUS COMPUTATION: The surface area of a sphere is 400π square centimeters. In terms of pi and cubic centimeters, what is the volume of this sphere?

ANSWER: **4000/3** (π cm^3) [or 1333 1/3]

_____ _____ 23. SCIENCE (calculation): The molar mass of carbon is 12.00 g/mole. The molar mass of hydrogen is 1.008 g/mole. The molar mass of oxygen is 16.00 g/mole. What is the molar mass of glucose, which has a formula of $C_6H_{12}O_6$? Be sure to include your units and the proper number of significant digits.

ANSWER: 180.10 g/mole

BONUS BONUS: What is the mass of a 2.50 mole sample of glucose? This ANSWER should also have the proper number of significant digits.

ANSWER: 4.50×10^2. g [also accept 450. g, read as "four hundred fifty (decimal) point grams"]

_____ _____ 24. SOCIAL STUDIES: **The first election this man voted in was his own presidential election. Succeeded by Millard Filmore, this man's death was likely caused by his consumption of strawberries and milk**. Who is this president, nicknamed "Ol' Rough and Ready" who was elected in 1848?

ANSWER: (Zachary) **Taylor**

BONUS

BONUS: Zachary Taylor gained fame from his victory at the Battle of Buena Vista in what war?

ANSWER: **Mexican-American** (War)

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: Evaluate $(5x - 3)^2$ [READ evaluate five X minus three, quantity squared]
ANSWER: **$25x^2 - 30x + 9$**

MATH: What is the term for the set of all the second coordinates in a relation?
ANSWER: **Range**

MATH COMPUTATION: Give the prime factorization of 288. Use exponents as necessary.
ANSWER: **$2^5 \times 3^2$** [may also say $3^2 \times 2^5$]

MATH COMPUTATION: What are the factors of $81d^2 - 169$?
ANSWER: **$(9d + 13)(9d - 13)$** (or reversed order)
  [May say nine X plus thirteen times nine X minus thirteen OR may say Quantity nine X plus thirteen times the quantity nine X minus thirteen]

MATH COMPUTATION:. How many sides does a regular polygon have if each exterior angle is 45 degrees?
ANSWER: **8**

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