

ROUND 8A

TOSS-UP

1) Math – *Short Answer* Evaluate the following expression: -19 minus the absolute value of -24.

Answer: -43

BONUS

1) Math – *Multiple Choice* Which of the following pizzas has the greatest total area:

W) A rectangular pizza, 18 inches by 12 inches

X) A square pizza, 15 inches by 15 inches

Y) A circular pizza with 14-inch diameter

Z) A circular pizza with 8-inch radius

Answer: X) A SQUARE PIZZA, 15 INCHES BY 15 INCHES

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### TOSS-UP

2) Energy – *Short Answer* Because of its volcanic “hot spots,” the Pacific Rim is an important area for generation of what type of renewable energy?

ANSWER: GEOTHERMAL ENERGY

### BONUS

2) Energy – *Short Answer* In passive solar homes located in the United States, most of the windows face in what cardinal direction?

ANSWER: SOUTH

**TOSS-UP**

3) General Science – *Short Answer* Which of the following is an ecosystem service provided by the ocean?

- W) Providing safe passage to mariners
- X) Restricting access to deep-ocean species
- Y) Sanitizing water in the hydrologic cycle
- Z) Absorbing heat from the sun's light

ANSWER: Z) ABSORBING HEAT FROM THE SUN'S LIGHT

**BONUS**

3) General Science – *Short Answer* Heavy water differs from light water because the hydrogen atoms in light water are replaced by what in heavy water?

ANSWER: DEUTERIUM (ACCEPT: HYDROGEN-2, HEAVY HYDROGEN)



**TOSS-UP**

4) Earth and Space – *Multiple Choice* During which of the following situations will sundogs be visible?

- W) Solar eclipse
- X) Lunar eclipse
- Y) Full moon
- Z) Aphelion

ANSWER: W) SOLAR ECLIPSE

**BONUS**

4) Earth and Space – *Multiple Choice* Fossils are usually found in what type of rock?

- W) Sedimentary
- X) Igneous
- Y) Metamorphic
- Z) Tuffaceous

ANSWER: W) SEDIMENTARY

### TOSS-UP

5) Physical Science – *Multiple Choice* Vinegar is a liquid solution containing acetic acid and water. It could be accurately classified as which of the following?

- W) Colloid
- X) Compound
- Y) Homogeneous mixture
- Z) Heterogeneous mixture

ANSWER: Y) HOMOGENEOUS MIXTURE

### BONUS

5) Physical Science – *Short Answer* Balance the following equation using simplest whole number coefficients:  $\text{Al} + \text{HCl}$  yields  $\text{AlCl}_3 + \text{H}_2$

ANSWER:  $2\text{Al} + 6\text{HCl}$  yields  $2\text{AlCl}_3 + 3\text{H}_2$

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TOSS-UP

6) Life Science – *Multiple Choice* What type of animal tissue is found in the ears and nose as structural support?

- W) Blood
- X) Cartilage
- Y) Adipose
- Z) Bone

ANSWER: X) CARTILAGE

BONUS

6) Life Science – *Short Answer* Starch and glycogen are polymers of what simple sugar?

ANSWER: GLUCOSE (ACCEPT: ALPHA-GLUCOSE OR D-GLUCOSE)

TOSS-UP

7) Physical Science – *Multiple Choice* In a circuit, electrons and electric current flow in what respective directions?

- W) Negative to positive; negative to positive
- X) Negative to positive; positive to negative
- Y) Positive to negative; positive to negative
- Z) Positive to negative; negative to positive

ANSWER: X) NEGATIVE TO POSITIVE; POSITIVE TO NEGATIVE

BONUS

7) Physical Science – *Multiple Choice* You accidentally drop a drinking glass. After the glass left your hand:

- W) The inertia of Earth pulled the glass down
- X) Gravity caused the glass to fall at a constant rate
- Y) Gravity caused the glass to fall faster and faster
- Z) The equal and opposite forces of gravity and air resistance acted upon it

ANSWER: Y) GRAVITY CAUSED THE GLASS TO FALL FASTER AND FASTER

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### TOSS-UP

8) Life Science – *Multiple Choice* Which of the following cell organelles is responsible for the function of respiration?

- W) Endoplasmic reticulum
- X) Lysosomes
- Y) Mitochondria
- Z) Golgi apparatus

ANSWER: Y) MITOCHONDRIA

### BONUS

8) Life Science – *Short Answer* What type of plant culturing method involves growing plants in mineral solutions instead of in soil?

ANSWER: HYDROPONICS

### TOSS-UP

9) Math – *Short Answer* Given  $f$  inverse of  $x$  equals  $5x$ , find  $f(x)$ .

ANSWER:  $x/5$

### BONUS

9) Math – *Multiple Choice* A triangle has two sides with lengths of 9 and 13. Which of the following choices is not a possible length for the missing side?

- W) 3
- X) 5
- Y) 20
- Z) 21

ANSWER W) 3

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### TOSS-UP

10) Earth and Space – *Multiple Choice* Which of the following can form when calcium ions precipitate from solution?

- W) Calcite
- X) Acid rain
- Y) Carbonic acid
- Z) Chert

ANSWER: W) CALCITE

### BONUS

10) Earth and Space – *Multiple Choice* Which of the following glacial features forms at the foot of a glacier?

- W) Drumlins
- X) Playa lakes
- Y) Kettle lakes
- Z) Moraines

ANSWER: Z) MORAINES

**TOSS-UP**

11) General Science – *Short Answer* What second magnitude star is found closest to the north celestial pole and is often called the north star?

ANSWER: POLARIS

**BONUS**

11) General Science – *Short Answer* How many embryonic leaves do dicot seedlings have?

ANSWER: TWO



**TOSS-UP**

12) Energy – *Short Answer* “Eternal flames” that burned when the ground was ignited during lightning storms was an example of what resource seeping out of the ground?

ANSWER: NATURAL GAS (ACCEPT: METHANE)

**BONUS**

12) Energy – *Short Answer* What term refers to the total quantity of electricity a utility company has on hand at any given time?

ANSWER: CAPACITY

**TOSS-UP**

13) General Science – *Short Answer* What logarithmic scale is used to describe the acidity or alkalinity of a solution?

ANSWER: pH SCALE

**BONUS**

13) General Science – *Short Answer* How many feet and inches, to the nearest inch, is 152 centimeters?

ANSWER: 5 FEET 0 INCHES



**TOSS-UP**

14) Math – *Short Answer* What is the volume of a cube, in cubic feet, if one edge is 4 inches long?

ANSWER: 1/27

**BONUS**

14) Math – *Multiple Choice* A cell phone plan costs a fixed rate per month plus 5 cents per text message sent and 10 cents for every minute used over 100 hours. If Michelle sent 100 text messages, used 30.5 hours, and paid \$25, how much is the fixed rate per month?

- W) \$20
- X) \$22
- Y) \$24
- Z) \$26

ANSWER: W) \$20

**TOSS-UP**

15) Earth and Space – *Short Answer* What solar feature follows an 11 year cycle?

ANSWER: SUNSPOTS

**BONUS**

15) Earth and Space – *Short Answer* On average, seawater in the world's oceans has a salinity of about 35 grams per liter. What are the two elements that contribute the most salinity in seawater?

ANSWER: SODIUM AND CHLORINE



**TOSS-UP**

16) Life Science – *Short Answer* In the traditional 5 Kingdom classification of organisms, four of the 5 Kingdoms are Animalia, Plantae, Fungi, and Protista. What is the fifth?

ANSWER: MONERA

**BONUS**

16) Life Science – *Short Answer* Jellyfish belong to what phylum?

ANSWER: CNIDARIA



### TOSS-UP

17) Physical Science – *Multiple Choice* The position of an element in the periodic table is determined by its:

- W) Atomic mass
- X) Density
- Y) Chemical activity
- Z) Atomic number

ANSWER: Z) ATOMIC NUMBER

### BONUS

17) Physical Science – *Short Answer* What is the name of the process by which a gas bypasses the liquid phase to become a solid?

ANSWER: DEPOSITION



### TOSS-UP

18) Energy – *Short Answer* The amount of oil obtained from a given well can be increased by pumping carbon dioxide gas into the well. What is this method called?

ANSWER: ENHANCED OIL RECOVERY (ACCEPT: TERTIARY PHASE RECOVERY)

### BONUS

18) Energy – *Short Answer* The Haber process is used for the industrial production of what basic compound?

ANSWER: AMMONIA

### TOSS-UP

19) General Science – *Multiple Choice* How many moons does the planet Mars have?

- W) 1
- X) 2
- Y) 3
- Z) 4

Answer: X) 2

### BONUS

19) General Science – *Short Answer* The usage of compounds based on what metal as an antiknocking agent was banned after the discovery that they cause extremely hazardous emissions?

ANSWER: LEAD



### TOSS-UP

20) Life Science – *Short Answer* What cells in a leaf surround the stomata?

ANSWER: GUARD CELLS

### BONUS

20) Life Science – *Multiple Choice* What is the innermost layer of the root cortex?

- W) Endodermis
- X) Cortex
- Y) Pericycle
- Z) Pith

ANSWER: W) ENDODERMIS

### TOSS-UP

21) Physical Science – *Multiple Choice* An inorganic binary compound always has a name that ends with what suffix?

- W) i-t-e
- X) a-t-e
- Y) i-d-e
- Z) o-u-s

ANSWER: Y) I-D-E

### BONUS

21) Physical Science – *Multiple Choice* Why do noble gases almost never form chemical bonds?

- W) It is difficult for gases to form bonds
- X) They have filled outer valence shells
- Y) They have very small atomic radii
- Z) They are very rare

ANSWER: X) THEY HAVE FILLED OUTER VALENCE SHELLS



### TOSS-UP

22) Math – *Short Answer* What percentage of \$2000 is \$400?

ANSWER: 20

### BONUS

22) Math – *Short Answer* What are the sum of the roots and the product of the roots, respectively, for the following quadratic equation:  $2x^2 + 6x - 5 = 0$

ANSWER: SUM = -3; PRODUCT = -5/2

### **TOSS-UP**

23) Earth and Space – *Short Answer* What is the name for the weak tides that occur when the Moon and the Sun's gravity oppose one another?

ANSWER: NEAP TIDES

### **BONUS**

23) Earth and Space – *Short Answer* What type of stars do not have sufficient mass to fuse hydrogen?

ANSWER: BROWN DWARF