

ROUND 4

TOSS-UP

1) MATH *Multiple Choice* Which of the following is NOT true:

- W) an irrational number is one that cannot be expressed as the ratio of integers
- X) fractions equal to 1 are called mixed fractions
- Y) the numerator is less than the denominator in a proper fraction
- Z) a composite number is a positive integer greater than 1 that is not prime

ANSWER: X) FRACTIONS EQUAL TO 1 ARE CALLED MIXED FRACTIONS

BONUS

1) MATH *Short Answer* Reduce the following fraction to a mixed fraction in lowest terms:

$$\frac{290}{25}$$

ANSWER: $11\frac{3}{5}$

TOSS-UP

2) GENERAL SCIENCE *Short Answer* Rounded to the nearest whole number, what is the specific gravity of water at standard temperature and pressure?

ANSWER: 1

BONUS

2) GENERAL SCIENCE *Short Answer* Arrange the following 4 choices in order of INCREASING speed of computer data transmission: 1 gigabyte per second; 1 kilobyte per second; 1 megabyte per second; 1 terabyte per second

ANSWER: 1 KILOBYTE PER SECOND; 1 MEGABYTE PER SECOND; 1 GIGABYTE PER SECOND; 1 TERABYTE PER SECOND

TOSS-UP

3) LIFE SCIENCE *Multiple Choice* In which of the following places would meiosis most likely occur in a mammal:

- W) skin
- X) liver
- Y) heart
- Z) ovary

ANSWER: Z) OVARY

BONUS

3) LIFE SCIENCE *Short Answer* What are the most common names of the gametes produced by a human male and female, respectively?

ANSWER: MALE = SPERM; FEMALE = EGG (ACCEPT: SPERM AND OVUM)

TOSS-UP

4) PHYSICAL SCIENCE *Short Answer* An empty plastic soda bottle is closed tightly at an elevation of 10,000 feet elevation and brought back to sea level. What is the visible condition of the bottle?

ANSWER: IT IS CRUSHED
(ACCEPT: COLLAPSED OR ANY OTHER REASONABLE SYNONYM)

BONUS

4) PHYSICAL SCIENCE *Short Answer* Name all of the following 3 choices that are physical properties of an object: length; mass; density

ANSWER: ALL

TOSS-UP

5) EARTH SCIENCE *Multiple Choice* A mangrove coast is likely to be found in which of the following locations:

- W) Alaskan Peninsula
- X) Hawaiian Islands
- Y) Florida
- Z) Maine

ANSWER: Y) FLORIDA

BONUS

5) EARTH SCIENCE *Multiple Choice* Which of the following is most important for climate because it transports large amounts of heat and moisture from the ocean to land:

- W) tides
- X) monsoons
- Y) longshore drift
- Z) erosion

ANSWER: X) MONSOONS

TOSS-UP

6) MATH *Multiple Choice* 0.143 is closest in value to which of the following fractions:

- W) $\frac{1}{7}$
- X) $\frac{3}{9}$
- Y) $\frac{2}{5}$
- Z) $\frac{5}{8}$

ANSWER: W) $\frac{1}{7}$

BONUS

6) MATH *Short Answer* Evaluate the following and give your answer as a mixed fraction in lowest terms: $2\frac{1}{6} \times \frac{13}{25}$

ANSWER: $1\frac{19}{150}$

TOSS-UP

7) GENERAL SCIENCE *Short Answer* Rounded to the nearest whole number, what is absolute zero in degrees Celsius?

ANSWER: -273

BONUS

7) GENERAL SCIENCE *Short Answer* Convert 1 million centimeters per hour into kilometers per hour:

ANSWER: 10

TOSS-UP

8) LIFE SCIENCE *Short Answer* What anatomical structures in humans function by connecting muscles to bones?

ANSWER: TENDONS

BONUS

8) LIFE SCIENCE *Short Answer* What is the light-yellow fluid that makes up the fluid portion of normal circulating human blood?

ANSWER: PLASMA (DO NOT ACCEPT: SERUM)

TOSS-UP

9) PHYSICAL SCIENCE *Short Answer* A screw driver and a doorknob are considered variations of what simple machine?

ANSWER: WHEEL AND AXLE

BONUS

9) PHYSICAL SCIENCE *Short Answer* Consider a lever with an ideal mechanical advantage of 8. What will its mechanical advantage be if the effort arm length is reduced by $\frac{1}{2}$?

ANSWER: 4

TOSS-UP

10) EARTH SCIENCE *Multiple Choice* Bioluminescence in marine organisms is important for all but which of the following functions:

- W) attracting prey
- X) communicating with other organisms
- Y) illumination
- Z) buoyancy

ANSWER: Z) BUOYANCY

BONUS

10) EARTH SCIENCE *Multiple Choice* Magmas that crystallize beneath the Earth's surface form intrusive bodies of igneous rock that are generally known as:

- W) pumice
- X) plutons
- Y) tuffs
- Z) breccia

ANSWER: X) PLUTONS

TOSS-UP

11) MATH *Short Answer* Convert 0.000328×10^{-6} into proper scientific notation:

ANSWER: 3.28×10^{-10}

BONUS

11) MATH *Short Answer* How many numbers from 1 through 30 are multiples of 3?

ANSWER: 10

TOSS-UP

12) GENERAL SCIENCE *Short Answer* Whereas mass is measured in kilograms, what SI unit is the most common measure of an object's weight?

ANSWER: NEWTON(S)

BONUS

12) GENERAL SCIENCE *Multiple Choice* On the earth's surface, which of the following is CLOSEST to the mass of 1,000 pounds:

- W) 454 kilograms
- X) 2,200 kilograms
- Y) 1 ton
- Z) 1 kiloton

ANSWER: W) 454 KILOGRAMS

TOSS-UP

13) LIFE SCIENCE *Multiple Choice* Most biological catalysts are:

- W) proteins
- X) vitamins
- Y) carbohydrates
- Z) lipids

ANSWER: W) PROTEINS

BONUS

13) LIFE SCIENCE *Multiple Choice* Which of the following best describes a bacteriophage:

- W) a bacterial virus
- X) a stage in the development of most bacteria
- Y) the release of disease-causing bacteria from a host organism
- Z) a very small bacteria

ANSWER: W) A BACTERIAL VIRUS

TOSS-UP

14) PHYSICAL SCIENCE *Multiple Choice* Which of the following will occur when an unbalanced force acts on an object:

- W) the object will stop
- X) the object will lose heat
- Y) the object will accelerate
- Z) the object will melt

ANSWER: Y) THE OBJECT WILL ACCELERATE

BONUS

14) PHYSICAL SCIENCE *Short Answer* What is the average acceleration, in kilometers per hour per second to the first decimal place, of a bird flying in a straight path from 0 to 50 kilometers per hour in 4 minutes and 10.0 seconds?

ANSWER: 0.2

(Solution: $50/250 = 0.2$ km/hr/sec)

TOSS-UP

15) EARTH SCIENCE *Multiple Choice* Which of the following terms best describes the crystal form of a mineral:

- W) tabular
- X) fluorescent
- Y) metallic
- Z) vitreous

ANSWER: W) TABULAR

BONUS

15) EARTH SCIENCE *Multiple Choice* Which of the following is the most common group of rock-forming minerals:

- W) sulfides
- X) carbonates
- Y) phosphates
- Z) silicates

ANSWER: Z) SILICATES

TOSS-UP

16) MATH *Multiple Choice* Which of the following is an expression for the perimeter of a rectangle if the length equals $10A$ and the width equals $6B$:

- W) $10A \times 6B$
- X) $20A + 12B$
- Y) $2(20A) + 2(12B)$
- Z) $10A^2 + 6B^2$

ANSWER: X) $20A + 12B$

BONUS

16) MATH *Short Answer* Giving your answer in dollars and cents, if 2 Frisbees cost \$16.50, how much will 5 Frisbees cost?

ANSWER: \$41.25

TOSS-UP

17) GENERAL SCIENCE *Multiple Choice* Which of the following is the MOST likely underlying reason why trees evolved with the capacity to grow tall:

- W) to absorb more carbon dioxide
- X) to enhance transpiration
- Y) to compete for sunlight
- Z) to produce more oxygen

ANSWER: Y) TO COMPETE FOR SUNLIGHT

BONUS

17) GENERAL SCIENCE *Multiple Choice* Consider a star observed just above the horizon in the western sky at dusk. Where would it most likely have been at sunrise that day:

- W) in the same position
- X) just above the horizon in the eastern sky
- Y) high in the western sky
- Z) high in the southern sky

ANSWER: X) JUST ABOVE THE HORIZON IN THE EASTERN SKY

TOSS-UP

18) LIFE SCIENCE *Multiple Choice* Which of the following plants is sometimes called a fiddlehead when it is immature:

- W) maple tree
- X) tulip
- Y) moss
- Z) fern

ANSWER: Z) FERN

BONUS

18) LIFE SCIENCE *Short Answer* Name all of the following 4 groups of animals that are reptiles: lizards; snakes; frogs; crocodiles

ANSWER: LIZARDS; SNAKES; CROCODILES (ACCEPT: ALL BUT FROG)

TOSS-UP

19) PHYSICAL SCIENCE *Short Answer* The exchange or sharing of what atomic particle is most directly involved in chemical bonding?

ANSWER: ELECTRONS

BONUS

19) PHYSICAL SCIENCE *Short Answer* How many valence electrons are in an oxygen atom, which resides in group 16 or 6A of the Periodic Table?

ANSWER: 6

TOSS-UP

20) EARTH SCIENCE *Multiple Choice* Which of the following would be used on a weather map to indicate a cold day in winter with clear, blue skies:

- W) capital L
- X) capital H
- Y) green shaded areas
- Z) pink shaded areas

ANSWER: X) CAPITAL H

BONUS

20) EARTH SCIENCE *Short Answer* What is the name for the northern-most latitude where the Sun can appear directly overhead?

ANSWER: THE TROPIC OF CANCER (ACCEPT: NORTHERN TROPIC)

TOSS-UP

21) MATH *Short Answer* Simplify the following expression by using the Distributive Property:
 $-3(2x - 6y + 3)$

ANSWER: $-6x + 18y - 9$ (ACCEPT: $18y - 6x - 9$)

BONUS

21) MATH *Short Answer* If exterior angles at two of the vertices of a triangle are 70° and 145° , what is the measure of an exterior angle at the third vertex, in degrees?

ANSWER: 145

TOSS-UP

22) GENERAL SCIENCE *Short Answer* What is the astronomical term for the bright trail of a meteoroid passing through the atmosphere of the Earth?

ANSWER: METEOR

BONUS

22) GENERAL SCIENCE *Multiple Choice* Which of the following foods contains the MOST calories:

- W) 1, twelve-ounce non-diet soda
- X) 1 tablespoon catsup
- Y) 1 8-ounce fresh orange
- Z) 1 tablespoon white, granulated sugar

ANSWER: W) 1, TWELVE-OUNCE NON-DIET SODA

TOSS-UP

23) LIFE SCIENCE *Short Answer* How many pairs of walking legs do spiders have?

ANSWER: 4

BONUS

23) LIFE SCIENCE *Short Answer* Name all of the following 4 organisms that are bivalves: squid; clams; snails; mussels

ANSWER: CLAMS; MUSSELS

TOSS-UP

24) PHYSICAL SCIENCE *Short Answer* Consider a yo-yo swinging on the end of a string in uniform circular motion. What is the most accurate term for the center-seeking force exerted on the yo-yo through the string?

ANSWER: CENTRIPETAL

BONUS

24) PHYSICAL SCIENCE *Short Answer* What are the four basic forces of the universe?

ANSWER: GRAVITY; ELECTROMAGNETISM; STRONG (FORCE); WEAK (FORCE)
(ACCEPT: GRAVITATION or GRAVITATIONAL FOR GRAVITY)

TOSS-UP

25) EARTH SCIENCE *Multiple Choice* Which of the following is a highly crystalline mineral with perfect cleavage:

- W) native gold
- X) native silver
- Y) graphite
- Z) halite

ANSWER: Z) HALITE

BONUS

25) EARTH SCIENCE *Short Answer* What period of the Geological Time Scale ends with the extinction of dinosaurs?

ANSWER: CRETACEOUS