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TOSS-UP

Matitude Mar At 12 198 1) PHYSICAL SCIENCE Short Answer If the density of a metal alloy is 5,430 kilograms per cubic meter, what is its specific gravity, rounded to the second decimal place? Inthitute 新春 · 養 · 豫 Inthitute 新光·蒙豫

ANSWER: 5.43

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BONUS

1) PHYSICAL SCIENCE Short Answer An Olympic runner braces himself against a stationary set of foot blocks and accelerates with a horizontal magnitude of 2 meters per second squared. How his mass is 70 kilograms? many newtons of horizontal force does the runner exert on the blocks to produce this acceleration if

ANSWER: 140

Ph.

1

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(Solution: F = MA; $F = 70 \times 2 = 140$) Milital Mark 'S

TOSS-UP

- 2) EARTH SCIENCE Multiple Choice Which of the following best explains the relative lack of hydrogen in our atmosphere in spite of its abundance in the Universe:
- W) most of it is tied up in the water molecule
 X) most of it is consumed in the
 - X) most of it is consumed in photosynthesis
 - Y) most of it escaped into space long ago because of its low mass
 - Z) most of it was an unstable isotope that decayed into helium

MASS ANSWER: Y) MOST OF IT ESCAPED INTO SPACE LONG AGO BECAUSE OF ITS LOW

BONUS

2) EARTH SCIENCE Multiple Choice Which of the following locations contains relatively young Militate Market 18 180 即即排音樂珠邊緣 coasts that formed as a consequence of continental rifting:

- W) southern coasts of the Aleutian Islands
 - X) Gulf of California
 - Y) Hawaii

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Z) northeastern Japan

ANSWER: X) GULF OF CALIFORNIA

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3) MATH Short Answer What is the x-intercept of a graph of the following equation: y = -7x + 7

ANSWER: 1 (ACCEPT: 1,0)

BONUS

3) MATH Short Answer Multiply the polynomial, $3x^2 - 4xy + y^2$, by -3xy, and simplify:

ANSWER: $-9x^3y + 12x^2y^2 - 3xy^3$

TOSS-UP

Matinta Mar At 13 1980 4) GENERAL SCIENCE Multiple Choice Which of the following filters can withstand temperatures up to 1400°C:

- W) paper cellulosic
- Y) polyester
 Z) ceramia X) borosilicate glass

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Y.

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ANSWER: Z) CERAMIC

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4) GENERAL SCIENCE Short Answer Convert 60 miles per hour into feet per second:

ANSWER: 88

(Solution: (60 mi/hr)(5280 ft/mi)(1 hr/3600 sec) = 88 ft/s)

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- 5) LIFE SCIENCE Multiple Choice Which of the following BEST describes muscle tone:
- W) maximum strength of a muscle
- X) length versus width of a muscle
- Y) average energy use or oxygen use of a fully contracted muscle
- Z) amount of tension or contraction of a resting muscle

ANSWER: Z) AMOUNT OF TENSION OR CONTRACTION OF A RESTING MUSCLE

BONUS

- 5) LIFE SCIENCE *Multiple Choice* Which of the following terms most commonly refers to nerves leaving the brain:
 - W) posterior
 - X) rostral
 - Y) efferent
 - Z) involuntary

ANSWER: Y) EFFERENT

TOSS-UP

- 6) PHYSICAL SCIENCE *Multiple Choice* Randy was precise in his lab experiment but he was not accurate. Which of the following best describes his measurements:
 - W) his data was close to the true value but not reproducible
 - X) his data was close to the true value and reproducible
 - Y) his data was not close to the true value but reproducible
 - Z) his data was not close to the true value and reproducible

ANSWER: Y) HIS DATA WAS NOT CLOSE TO THE TRUE VALUE BUT REPRODUCIBLE

BONUS

6) PHYSICAL SCIENCE *Short Answer* Using a gravitational acceleration of 10 meters per second and giving your answer in appropriate SI units, if dropped off a cliff, how fast will a rock be falling at the end of 2 seconds, if friction is ignored?

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ANSWER: 20 METERS PER SECOND (must give units)

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- 7) EARTH SCIENCE Multiple Choice The Earth's mantle is thought to be composed of which of the following:
- W) coal

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Y.

Y.

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1

Ph.

Y.

- X) granite
- Z) peridotite

ANSWER: Z) PERIDOTITE

BONUS

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7) EARTH SCIENCE *Short Answer* Giving your answer in hours and minutes, how often will the entire tidal pattern on Earth be repeated?

ANSWER: 24 HOURS AND 50 MINUTES

TOSS-UP

8) MATH Short Answer What is the common ratio of the geometric series with the first three Maritanto 教育 养 · 溪 · 溪 Malitude 教育 养 · 漢 · 學

ANSWER: $\frac{1}{2}$

BONUS

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8) MATH Short Answer What is the least common multiple of the numbers 30, 45, and 60? Military Market

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ANSWER: 180

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- 9) GENERAL SCIENCE Multiple Choice Which of the following best describes a coelacanth (read as: SEE-la-canth):
- W) living fossil fish

Y.

Y.

Y.

Y.

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Y.

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- X) extinct amphibian
- Z) an air-breathing extinct fish

ANSWER: W) LIVING FOSSIL FISH

BONUS

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9) GENERAL SCIENCE Short Answer Which of the following 3 choices are reference scales commonly used in describing the hardness of materials: Poolsmall.

ANSWER: ROCKWELL

TOSS-UP

- 10) LIFE SCIENCE Multiple Choice Into which of the following does a typical fern spore most directly develop:
- X) egg cell Y) ~ W) sporophyte

 - Y) gametophyte
 - Z) sperm cell

ANSWER: Y) GAMETOPHYTE

BONUS

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Mytitute 精神 林 溪 序忆 10) LIFE SCIENCE Short Answer Name all of the following 4 plants that are conifers:

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pine; hemlock; palm; maple

Asitute the by Service of the servic ANSWER: PINE; HEMLOCK Maritule We # 3

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- 11) PHYSICAL SCIENCE Multiple Choice Which of the following most likely occurs when one molecule is oxidized:
- W) another molecule is reduced
- X) there is a release in work

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- Y) the system becomes more ordered
- Z) the reaction is at equilibrium

ANSWER: W) ANOTHER MOLECULE IS REDUCED

BONUS

11) PHYSICAL SCIENCE Short Answer Arrange the following 3 pure substances in order of INCREASING evaporation rates at 1 atmosphere of pressure and a substances in order of INCREASING evaporation rates at 1 atmosphere of pressure and a substances in order of INCREASING evaporation rates at 1 atmosphere of pressure and a substances in order of INCREASING evaporation rates at 1 atmosphere of pressure and a substances in order of INCREASING evaporation rates at 1 atmosphere of pressure and a substances in order of INCREASING evaporation rates at 1 atmosphere of pressure and a substances in order of INCREASING evaporation rates at 1 atmosphere of pressure and a substances in order of INCREASING evaporation rates at 1 atmosphere of pressure and a substances in order of INCREASING evaporation rates at 1 atmosphere of pressure and a substance of pressure and a subst water; acetone; aluminum

ANSWER: ALUMINUM; WATER; ACETONE

TOSS-UP

- 12) EARTH SCIENCE Multiple Choice Which of the following were NOT produced by the eruption of Mount Saint Helens in 1980: 面的加州 institute the the light of the Militate Mit His 1880
- W) lahar (read as: lah-HAR) flows
- X) pyroclastic flows
- Y) significant ashfall deposits
- Z) basic lava

ANSWER: Z) BASIC LAVA

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BONUS

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12) EARTH SCIENCE Short Answer All of the volcanoes of Hawaii belong to which one of the 3 basic types? Britists Mark 13 198 例加格教育 Drippy of the state of the stat

ANSWER: SHIELD

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Matitude Mar At 12 198 13) MATH Short Answer Reduce the following expression to lowest terms:

> $\frac{3x+y}{}$ (ACCEPT: CANNOT BE REDUCED) ANSWER:

BONUS

13) MATH *Short Answer* Find the prime factorization of 90:

ANSWER: $2 \times 3 \times 3 \times 5$ (ACCEPT: $2 \times 3^2 \times 5$)

TOSS-UP

- 14) GENERAL SCIENCE Multiple Choice Which of the following is a native American fruit that is typically grown in bogs and harvested in the fall:
- W) cherries

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Y.

Y.

Y.

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- X) blueberries
- Y) cranberries
- Z) huckleberries

ANSWER: Y) CRANBERRIES

BONUS

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14) GENERAL SCIENCE Multiple Choice Which of the following is the pigment responsible for 面对油油水料接牌 Mailing 教 林·婆 序 **加州州 紫 珠 溪 豫** the characteristic red color of the cranberry:

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- W) red dye number 2
- X) carotene

- Y) carmine red
- Z) anthocyanin

ANSWER: Z) ANTHOCYANIN

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- 15) LIFE SCIENCE Multiple Choice Which of the following is a theory of heredity postulated by Lamarck:
- W) characteristics acquired after birth are passed on to following generations
- X) nature selects for the best characteristic
- Y) only the fittest organisms survive through natural selection
- Z) genes determine the phenotype

ANSWER: W) CHARACTERISTICS ACQUIRED AFTER BIRTH ARE PASSED ON TO FOLLOWING GENERATIONS

BONUS 1/2

15) LIFE SCIENCE Short Answer By words or numbers, name all of the following 3 choices that are found in the E. coli bacterium: 1) mitochondria; 2) chloroplasts; 3) ribosomes

ANSWER: 3) RIBOSOMES

TOSS-UP

- 16) PHYSICAL SCIENCE Multiple Choice Which of the following molecules is considered the most polar: Militing 新春樓像 Maritule 教育 养 '養 序® Militate Market 18 182 Maritule # # ' ' FR
- W) CH₄
- X) HF

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1

Y) F₂

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Z) CO_2

ANSWER: X) HF

BONUS

16) PHYSICAL SCIENCE Short Answer In addition to oxygen and sodium, what other element is a major constituent of borax? Stitute the the is the Britists Mar 14 '35 PR **阿尔**斯斯 茶菜 烧 Willing the the the control of the c

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ANSWER: BORON

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- Matinta Mar At ' 13 PR 17) EARTH SCIENCE Multiple Choice A Beaufort number of 4 indicates:
 - W) a moderate earthquake
 - X) a moderate breeze
 - Y) a strong tornado

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Y.

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1

1

Y.

Z) a mineral similar in hardness to fluorite

ANSWER: X) A MODERATE BREEZE

BONUS

- 17) EARTH SCIENCE Multiple Choice If cumulus mammatus clouds are heading in your direction, you may soon experience:
 - W) clearing skies
 - X) severe weather
 - Y) high pressure conditions
 - Z) snow

ANSWER: X) SEVERE WEATHER

TOSS-UP

18) MATH Short Answer Find the sum of 7 times 23, and 3 times 23:

ANSWED: 220

ANSWER: 230

(Solution: (7 + 3)(23) = 230)

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18) MATH Short Answer Solve the following equation for x: (4x-8)-(5x+6)=(2x-9)-(4x+1)

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$$(4x-8)-(5x+6)=(2x-9)-(4x+1)$$

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19) GENERAL SCIENCE Short Answer What human disease is caused by infection with the rhinovirus?

ANSWER: COMMON COLD (ACCEPT: COLD)

BONUS 1/3

19) GENERAL SCIENCE Short Answer Name all of the following 4 diseases for which effective vaccines are currently available: chicken pox; malaria; diphtheria; HIV

ANSWER: CHICKEN POX; DIPHTHERIA

TOSS-UP

- 20) LIFE SCIENCE Multiple Choice Which of the following is LEAST likely to be found in or on a root of a flowering plant: Milling 教教教養際 Milling 教教 · 養 · 豫 Maritute Mark 1/2 1/8

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Y.

Y.

Y.

Y.

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- W) stomata
 X) en: ' X) epidermis
 - Y) xylem
 - Z) phloem

ANSWER: W) STOMATA

BONUS

20) LIFE SCIENCE Short Answer What is the common name for the protective layers of cells that cover the tip of a growing root, allowing it to make its way through difficult soils? Militate Market 18 180 Millinin Art Art 18 180 British the 18 182

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ANSWER: ROOT CAP

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21) PHYSICAL SCIENCE *Short Answer* When aluminum filings are added to a beaker containing concentrated sulfuric acid, what gas is produced?

ANSWER: HYDROGEN (ACCEPT: H₂)

BONUS 🖔

21) PHYSICAL SCIENCE Short Answer Rounded to the first decimal place, what is the current, in amperes, for a 60-watt bulb running on a 120-volt power source?

ANSWER: 0.5

Y.

1

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W.

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(Solution: current = watts/volts; 60/120 = 0.5 amperes)

TOSS-UP

Space Shuttle orbit? 22) EARTH SCIENCE Short Answer In which of the 5 main layers of Earth's atmosphere does the

ANSWER: THERMOSPHERE

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22) EARTH SCIENCE *Short Answer* Order the following 4 life forms from the EARLIEST to appear on Earth to the most RECENT: crocodile; jawless fish: jawed fish: and 1

ANSWER: JAWLESS FISH; JAWED FISH; CROCODILE; ANTELOPE

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23) MATH Short Answer Any triangle inscribed within a semicircle is always what type of triangle if one of its sides is the diameter of the semicircle?

ANSWER: RIGHT

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Y.

Y.

Y.

Y.

Y.

1

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Y.

BONUS

23) MATH Short Answer Provide the prime factors over the integers for the following expression: $25x^4 - 16y^2$

ANSWER: $(5x^2 + 4y)(5x^2 - 4y)$

TOSS-UP

24) GENERAL SCIENCE Short Answer Which of the following 4 star types is believed to be the most common in the universe: neutron; blue giant; red dwarf; pulsar Marithle Mar Nr. 18 P.

ANSWER: RED DWARF

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BONUS

24) GENERAL SCIENCE Short Answer Which one of the following 5 spectral classes of stars is THE WALLES the HOTTEST: A; F; G; K; O

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ANSWER: 0

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Marithle Mark & Pic 25) LIFE SCIENCE Short Answer What sugar is found in the backbone of DNA?

ANSWER: DEOXYDIBOSE (1.27)

ANSWER: DEOXYRIBOSE (ACCEPT: RIBOSE)

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25) LIFE SCIENCE *Short Answer* Name all of the following 4 trees that produce true flowers: hemlock; palm; maple; pine

ANSWER: PALM; MAPLE Marithle Mar Hr ' & PR Motivite # 14 18 motivite # 14 18

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