ROUND 14

TOSS-UP

Matinta Mar ph ' 18 PR 1) MATH Multiple Choice The graph of which of the following equations has a negative slope:

W)
$$y = 2x - 4$$

X)
$$y = -2x + 4$$

Y) $y = -4$
Z) $x = -2$

Y)
$$y = -4$$

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Z)
$$x = -2$$

ANSWER: X) y = -2x + 4

BONUS &

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Matitude Mark to 180 1) MATH *Short Answer* Simplify the following completely:

ANSWER: $-10x^2z$

TOSS-UP

- 2) GENERAL SCIENCE *Multiple Choice* Which of the following is NOT true:

- X) snowflakes and raindrops often contain bacteria
 Y) a general rule for solubility. Y) a general rule for solubility is that 'like dissolves like'
 - Z) a super-cooled liquid is a liquid at a temperature below its normal freezing point

ANSWER: W) ALL FIRES BURN WITH A YELLOW FLAME

BONUS

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- 2) GENERAL SCIENCE Multiple Choice Which of the following BEST describes the range of sizes of most animal cells:

- X) 2.0 to 4.0 micrometers Y) 5.0 to 200 Y) 5.0 to 20.0 micrometers
 Z) 12.0 to 40.0 micro

ANSWER: Y) 5.0 TO 20.0 MICROMETERS Myithin Mar phar 18 1980 Marithula Mark 13 18

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- 3) LIFE SCIENCE Multiple Choice Which of the following is most advantageous to plants that depend on insects for pollination:
- W) absence of rhizomes
- X) sticky pollen

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- Z) numerous stomata Y) small green flowers

ANSWER: X) STICKY POLLEN

BONUS

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3) LIFE SCIENCE *Short Answer* Name all of the following biological molecules that are considered polymers: glucose; cellulose: DNA. DNA

ANSWER: CELLULOSE; DNA; RNA (ACCEPT: ALL BUT GLUCOSE)

TOSS-UP

- 4) PHYSICAL SCIENCE Multiple Choice Which of the following materials in pure form would register the LOWEST amount of ohms for a given electric current at 20°C if all other variables are constant: Maritule # # 18 18 Militate At 18 18 Militale Market 18 18
- W) silver
- X) gold
- Y) tin
- Z) lead

ANSWER: W) SILVER

BONUS

4) PHYSICAL SCIENCE Multiple Choice Which of the following optical devices produces a real image: Mylithin the the light of the Mylithin Mark 18 18 Stitute the the light of the

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- W) plane mirror
- X) convex mirror
 - Y) concave lens
 - Z) convex lens

Maritale Mark 18 18 ANSWER: Z) CONVEX LENS Misitate At 13

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- 5) EARTH SCIENCE Multiple Choice A semidiurnal tidal pattern is more typical of which of the following locations:
- W) the East Coast of the U.S.
- X) the West Coast of the U.S.
- Z) the North Pole Y) the Gulf of Mexico

ANSWER: W) THE EAST COAST OF THE U.S.

BONUS

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- 5) EARTH SCIENCE *Multiple Choice* Which of the following is the most notable product of the hydrolysis of feldspar:
 - W) chalk
 - X) sandstone
- Z) halite Y) clay minerals

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ANSWER: Y) CLAY MINERALS

6) MATH Multiple Choice Which of the following is closest in value to $\sqrt{51}$:

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- W) 5.1
- X) 5.5
- Y) 6.8
- 7.0.8 Z) 7.1

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ANSWER: Z) 7.1

BONUS

6) MATH *Short Answer* Find the next 3 terms of the arithmetic sequence whose first 3 terms are: 23, 15, 7

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ANSWER: −1, −9, −17

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- 7) GENERAL SCIENCE *Multiple Choice* Which of the following is one of the most likely causes of algal blooms in waterways along the Chesapeake Bay:
- W) fertilizers

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Y.

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- X) natural pesticides and
- Z) plastics pollution Y) nitrogen-fixing bacteria

ANSWER: W) FERTILIZERS

BONUS

7) GENERAL SCIENCE *Short Answer* Giving your answer as winter, spring, summer, or fall, in what season will "dead zones" be most prevalent in the Chasagastra Bar 2

ANSWER: SUMMER

TOSS-UP

- Military Mark 13 8) LIFE SCIENCE Multiple Choice Pampas, steppes, and savannas are all different types of:
 - W) deserts
 - X) tropical forests
 - Y) tropical shrublands
 - Z) grasslands

ANSWER: Z) GRASSLANDS

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8) LIFE SCIENCE Multiple Choice Which of the following biomes takes up more square area of the world than any other biome:

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- W) rainforest
- X) savanna
- Y) taiga
- Z) tundra

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ANSWER: Y) TAIGA

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- 9) PHYSICAL SCIENCE Multiple Choice Hydrogen bonding is NOT important in the physical and chemical properties of:
- W) liquid water
- X) water ice

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Z) methane gas

ANSWER: Z) METHANE GAS

BONUS

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9) PHYSICAL SCIENCE Short Answer Arrange the following 3 diatomic molecules in order of INCREASING number of bonds between atoms: oxygen: fluorica:

ANSWER: FLUORINE; OXYGEN; NITROGEN

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TOSS-UP

- 10) EARTH SCIENCE *Multiple Choice* Which of the following is NOT a key step in the rock cycle:
- W) cementation
- X) melting
- Y) cooling
- Z) evaporation

ANSWER: Z) EVAPORATION

BONUS

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- Milling 新洲 · 養原 10) EARTH SCIENCE Multiple Choice Most of Earth's deserts in the northern hemisphere are located near which of the following latitudes:
 - W) 0°
 - X) 30°
 - Y) 70°
 - Z) 90°

ANSWER: X) 30° Mytitute 新春 株 该 % Imhilitite 教育教·蒙察

11) MATH Short Answer Express the following radical in simplified form for all positive values of x and y: $\sqrt{(36x^4y^6)}$

ANSWER: $6x^2y^3$

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BONUS

11) MATH Short Answer Find the product of $\sqrt{5x^2}$ times $\sqrt{5x}$, giving your answer in its simplest radical form for all positive values of x:

ANSWER: $5x\sqrt{x}$

TOSS-UP

- 12) GENERAL SCIENCE Multiple Choice Which of the following is typically used to sterilize laboratory glassware:
- W) hot plate
- X) freeze dryer
- Y) autoclave
- Z) fume hood

ANSWER: Y) AUTOCLAVE

BONUS

- 12) GENERAL SCIENCE *Multiple Choice* Which of the following is NOT true of the Big Dipper:
- W) it is a well known constellation that can be seen from mid-northern latitudes X) it appears on the opposite side of the North Start

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Y) it is sometimes called the Plough

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Z) assuming clear skies, it can be seen throughout the night every night of the year from midnorthern latitudes

ANSWER: W) IT IS A WELL KNOWN CONSTELLATION THAT CAN BE SEEN FROM MID-NORTHERN LATITUDES

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- 13) LIFE SCIENCE *Multiple Choice* Which of the following is the most likely highest power for an objective lens on a typical student compound light microscope:
- W) 25-times
- X) 100-times
- Y) 500-times
- Z) 1500-times

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ANSWER: X) 100-TIMES

BONUS

13) LIFE SCIENCE *Short Answer* Order the following 4 parts of the human intestine from the FIRST to receive food from the stomach to the LAST: colon; duodenum; ileum; jejunum

ANSWER: DUODENUM; JEJUNUM; ILEUM; COLON

TOSS-UP

- 14) PHYSICAL SCIENCE Multiple Choice Which of the following is NOT true of pH:
- W) the terms basic or alkaline describe a solution with pH greater than 7
- X) the highest value on the pH scale is 14
- Y) strong acids dissociate almost completely in water
- Z) a pH meter operates by measuring small differences in the density of different fluids

ANSWER: Z) A PH METER OPERATES BY MEASURING SMALL DIFFERENCES IN THE DENSITY OF DIFFERENT FLUIDS

BONUS

- 14) PHYSICAL SCIENCE *Multiple Choice* A decrease of 1 unit on the pH scale represents which of the following:
- W) a 10-fold increase in the hydrogen ion concentration
- X) a 10-fold decrease in the hydrogen ion concentration
- Y) a 100-fold increase in the hydrogen ion concentration
 - Z) a 100-fold decrease in the hydrogen ion concentration

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ANSWER: W) A 10-FOLD INCREASE IN THE HYDROGEN ION CONCENTRATION

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- 15) EARTH SCIENCE Multiple Choice Earth's atmosphere contains several different layers that are most often defined according to:
- W) pressure

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- X) moisture
- Z) temperature Y) wind velocity

ANSWER: Z) TEMPERATURE

BONUS

15) EARTH SCIENCE Short Answer Name all of the following 3 choices that influence wind direction on Earth: Coriolis effect; centripetal force: pressure endicate

ANSWER: ALL

TOSS-UP

16) MATH *Multiple Choice* Which of the following is closest in value to 79²:

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- W) 6084
- X) 6241
- Y) 6399 7) 7

ANSWER: X) 6241

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16) MATH Short Answer Solve the following equation for x: $9x^2 + 12x = -$

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ANSWER: -Millinin 教教教·蒙然 Maritante Art 18 18

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17) GENERAL SCIENCE Short Answer In 2005, into what celestial object did the Deep Impact probe crash into?

ANSWER: COMET (ACCEPT: COMET TEMPLE)

BONUS

- 17) GENERAL SCIENCE Multiple Choice Which of the following terms is used most often by astronomers for the total energy emitted per unit time from a star:
- W) apparent magnitude
- X) watts

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- Y) luminosity

ANSWER: Y) LUMINOSITY

TOSS-UP

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- 18) LIFE SCIENCE Multiple Choice The presence of which of the following is the most important characteristic that allows xylem to function in plants:
- X) strong thick walls
 Y) large fluit W) plastids and chloroplasts

 - Y) large fluid-filled vacuoles
 - Z) nuclei and endoplasmic reticulum

ANSWER: X) STRONG THICK WALLS

(Solution: xylem cells are dead therefore, W and Z are not possible and Y is unlikely)

BONUS

18) LIFE SCIENCE Short Answer Name all of the following 4 structures that are composed mostly of keratin: bird's beak; snake teeth; human fingernail; mammalian fur

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ANSWER: BIRD'S BEAK; HUMAN FINGERNAIL; MAMMALIAN FUR

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(ACCEPT: ALL BUT SNAKE TEETH)

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- 19) PHYSICAL SCIENCE Multiple Choice Francium has the lowest electronegativity of the elements. This would indicate that francium is in what corner of the periodic chart:
- W) upper left

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- X) lower left
- upper right Z) lower right

ANSWER: X) LOWER LEFT

BONUS

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- 19) PHYSICAL SCIENCE *Multiple Choice* Which of the following compounds is LEAST soluble in water and is frequently used as a radiocontrast agent in imagine of the CV
 - W) sodium chloride
 - X) potassium chloride
- Z) sodium hydroxide

ANSWER: Y) BARIUM SULFATE

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20) EARTH SCIENCE Short Answer At any one time, there are always how many major tidal bulges on Earth?

ANSWER: 2

BONUS

Milital 精 社 接 % 20) EARTH SCIENCE Short Answer Which 2 of the following 4 choices are primarily responsible for the creation of two major tidal bulges on the Earth: gravity; wind; inertia; sunlight

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Willing the 14 18 18 ANSWER: GRAVITY; INERTIA Milliante Am Ax 38

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21) MATH Short Answer Your English teacher asks that you learn 2 new words every day. If you started with 12 new words, how many total new words will you learn after 30 days?

ANSWER: 72

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(Solution:
$$w = 12 + 2d = 12 + 2(30) = 72$$
 words)

BONUS

21) MATH Short Answer Arrange the following 4 choices in INCREASING order: Maritute Mar At 13 1980 Maritude Mar At 13 1980

21) MATH *Short Answer* Arrange the following 4
$$\frac{0.5}{\pi}$$
; $\sqrt{0.5}$; 0.5^2 ; $\sqrt[3]{5}$ (read as: the cube root of 5) ANSWER: $\frac{0.5}{\pi}$; 0.5^2 ; $\sqrt{0.5}$; $\sqrt[3]{5}$

ANSWER:
$$\frac{0.5}{\pi}$$
; 0.5^2 ; $\sqrt{0.5}$; $\sqrt[3]{5}$

TOSS-UP

Marith Mar Nr 18 198 22) GENERAL SCIENCE Short Answer What uranium isotope is most common on Earth?

ANSWER: URANIUM-238 (ACCEPT: 238)

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Maritha Mark 13 1980 22) GENERAL SCIENCE Short Answer What is the common name for the plant from which the prized spice saffron is derived?

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23) LIFE SCIENCE Short Answer What natural plant hormone is most directly involved in controlling phototropism?

ANSWER: AUXIN (ACCEPT: INDOLE ACETIC ACID or IAA)

23) LIFE SCIENCE Short Answer Name all of the following 3 types of molecules that are generally soluble in water: simple sugars; mRNA; lipids

ANSWER: SIMPLE SUGARS; mRNA

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TOSS-UP

24) PHYSICAL SCIENCE Short Answer Knowing that carbon is in group 4 and period 2 on the Periodic Table, give the electron configuration of the carbon atom: Mininte 教教教·後序

(ACCEPT: $[He]2s^22p^2$)

BONUS

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24) PHYSICAL SCIENCE Short Answer Arrange the following 4 materials in DECREASING Thistitute was by the best of the second order of thermal conductivity: granite; rubber; gold; lead

ANSWER: GOLD; LEAD; GRANITE; RUBBER

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25) EARTH SCIENCE Short Answer What is the MOST common name for the last stellar stage in the life of our Sun?

ANSWER: WHITE DWARF (ACCEPT: BLACK DWARF)

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BONUS 3

Militate starte 25) EARTH SCIENCE *Short Answer* The decay rate of the radioactive isotope potassium-40 into stable argon-40 can be used to radiometrically date rocks. If it takes 1.28 billion years for half the potassium-40 to decay into argon-40, a rock that contains a 50/50 ratio of the two is how many billion years old, to the second decimal place?

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