7^2

6.15%

2015 Cindy D. Wright Mathematics Tournament presented by Pizitz Middle School

8th Grade Written Test

Directions:

1. Do not open this test until you are told to do so by the proctor.

2. 60 minutes will be allowed for completing this test. The proctor will keep time. Students must stay in the testing room for the full 60 minutes. Anyone leaving the testing room for an emergency must turn in their test and scantron answer sheet and not return.

3. Use a #2 lead pencil.

4. No calculators, books, notes, or other aides may be used. If your watch has a calculator, please remove your watch now. Cell phones must be turned off.

5. Scratch paper will be provided; you may not furnish your own. If you need more scratch paper during the test, raise your hand, and your proctor will bring it to you. You may write on your test.

6. You will receive four points for each correct answer and have one point deducted for each incorrect answer. An answer left blank will not change the score.

7. There are three tiebreakers at the end of the test. Write your name, your school name, grade, and tiebreakers answers in the top margin on the back of your scantron. If the tiebreakers do not break a tie, then the test will be scored backwards, with the first person to not answer a question correctly being given the lower place.
   Please write your name, school, and TB1, TB2, and TB3 on the back of your scantron answer sheet now.

8. Please give your scantron answer sheet to the proctor before leaving the testing room. You may keep your copy of the test. Answer Keys will be posted in the corner areas on each floor and in the cafeteria.

Good Luck!

1. Simplify $-2^4 - 2^0 \div 2^2 + (-2)^4$

    A. $32\frac{1}{4}$ B. $-\frac{1}{4}$ C. $\frac{1}{4}$ D. $31\frac{3}{4}$ E. NOTA

2. Solve : $(2a-3)-(4a+1)=5-5a$

    A. $\{2\}$ B. $\{-2\}$ C. $\{3\}$ D. $\{-3\}$ E. NOTA

3. Given $H(s)=s^2-s$, find H(-2).

    A. 6   B. 2   C. 0   D. -2   E. NOTA

4. When $\frac{5}{6}$ is subtracted from a number, the result is $\frac{2}{3}$. Find the additive inverse of the multiplicative inverse of the number.

    A. $-\frac{3}{2}$ B. $\frac{3}{2}$ C. $\frac{2}{3}$ D. $-\frac{2}{3}$ E. NOTA

5. If $yz : zx : xy = 1:2:3$, then find $\dfrac{x}{yz} : \dfrac{y}{zx}$

    A. 4:1   B. 1:2   C. 1:4   D. 2:1   E. NOTA

6. In how many distinct ways can your rearrange the letters in "DIVERGENT" other than the given form.

    A. 181440   B. 362880   C. 181439   D. 362879   E. NOTA

7. Hiccup Horrendous Haddock III is building a scale model of a dragon. For the scale, Hiccup lets every 1.5 cm of his scale model represent 1 m of the real dragon (assume dragons exist for this problem). If Hiccup's model is 15 cm long, how long is the real dragon in centimeters?

    A. 10   B. 50   C. 100   D. 1000   E. NOTA

8. Simplify: $-(-3^{-2})^{-1} \cdot \left[(-6)^{-1}\right]^{-1}$

    A. $\frac{1}{54}$ B. $-\frac{1}{54}$ C. 54   D. -54   E. NOTA

9. Sally weighs more than Suzie but less than Molly. Their weights are consecutive multiples of 5. If they each lost 4 kilograms, the sum of their weights would be 303 kilograms. How much does Molly weigh now?

    A. 100   B. 105   C. 110   D. 106   E. NOTA

10. Find the value of $\dfrac{y}{3}-\dfrac{x}{2}$, if $1-2x=7$ and $-2=16-3y$.

    A. $-3\dfrac{1}{2}$ B. $3\dfrac{1}{2}$ C. -4 D. 4 E. NOTA

11. The measures of the exterior angles of a convex hexagon are $x^{\circ},x^{\circ},(x+5)^{\circ},(x+5)^{\circ},2x^{\circ}$ and $2x^{\circ}$. What is the measure of the largest pair of exterior angles?

    A. 27.5° B. 87.5° C. 48.75° D.133.75° E. NOTA

12. Determine an equation of the line that passes through the point $(-2,-6)$ and has a slope of $\dfrac{4}{3}$.

    A. $4x+3y=-10$ B. $4x-3y=10$ C. $3x-4y=10$ D. $3x+4y=-10$ E. NOTA

13. Pinocchio's nose length is directly proportional to the number of lies he tells. If he tells 3 lies his nose grows 48 cm. How many millimeters long will his nose be if he lies 47 times?

    A.7520   B. 752   C. 2850   D. 285   E. NOTA

14. Solve: $\sqrt[3]{4+x}=5$

    A. $\{1\}$ B. $\{11\}$ C. $\{21\}$ D. $\{121\}$ E. NOTA

15. If two-thirds of p is 6, three-fifths of q is 2, and five-sixths of r is 1, evaluate pqr.

    A. 4   B. $\dfrac{1}{3}$ C. 36   D. 12   E. NOTA

16. If $f(x)=x^2+ax+b$ has 2 and -4 as its two zeros, what is the value of $a+b$?

    A. 2   B. -8 C. -4 D. -6 E. NOTA

17. Find a rational number between $\sqrt{2}$ and $\sqrt{3}$.

    A. $\dfrac{\sqrt{2}+\sqrt{3}}{2}$ B. $\dfrac{\sqrt{2}\cdot\sqrt{3}}{2}$ C. 1.5   D. 1.8   E. NOTA

18. Find the value of y so that the slope of the line containing the points $\left(-\dfrac{1}{3},\dfrac{1}{2}\right)$ and $\left(\dfrac{3}{4},y\right)$ is $-\dfrac{2}{3}$.

    A. $-\dfrac{2}{9}$ B. $-\dfrac{9}{8}$ C. $-\dfrac{9}{2}$ D. $\dfrac{9}{2}$ E. NOTA

19. Two candles of the same height are lighted at the same time. The first is consumed in 4 hours and the second in 3 hours. Assuming that each candle burns at a constant rate, in how many hours after being lighted was the first candle twice the height of the second?

A. $1\frac{1}{2}$ B. $2\frac{2}{5}$ C. 2   D. $2\frac{1}{2}$ E. NOTA

20. Find the sum of the y-intercept(s) and the x-intercept(s) of $y = 5x^2 - 10x - 15$

A. -13 B. -5 C. 2   D. -15 E. NOTA

21. Solve: $|1 - 3n| > 7$

A. $\left\{n : -\frac{8}{3} < n < 2\right\}$ B. $\left\{n : n < -2 \text{ or } n > \frac{8}{3}\right\}$ C. $\left\{n : -2 < n < \frac{8}{3}\right\}$ D. $\left\{n : n < -\frac{8}{3} \text{ or } n > 2\right\}$ E. NOTA

22. Find the sum to infinity of $\dfrac{1}{7} + \dfrac{2}{7^2} + \dfrac{1}{7^3} + \dfrac{2}{7^4} + \ldots$

A. $\dfrac{1}{24}$ B. $\dfrac{5}{48}$ C. $\dfrac{3}{16}$ D. $\dfrac{1}{16}$ E. NOTA

23. A circle is inscribed in a triangle with sides 8, 15, and 17. Find the radius of the circle.

A. 6   B. 2   C. 5   D. 3   E. NOTA

24. If $f(n) = \dfrac{1}{3}n(n+1)(n+2)$, then find $f(r) - f(r-1)$

A. $r(r+1)$ B. $(r+1)(r+2)$ C. $\dfrac{1}{3}r(r+1)$ D. $\dfrac{1}{3}(r+1)(r+2)$ E. NOTA

25. Alex, Tuck, and Munch started out on a 100 mile journey. Alex and Munch went by automobile at the rate of 25 mph, while Tuck walked at the rate of 5 mph. After a certain distance, Munch got off and walked on at 5 mph, while Alex went back for Tuck and got him to the destination at the same time that Munch arrived. Find the number of hours required for the trip.

A. 5   B. 6   C. 7   D. 8   E. NOTA

Tiebreakers *Please write tiebreaker answers in the top margin on the back of the scantron.*

TB1. Simplify: $\sqrt{-36}\left(\sqrt{-81} - \dfrac{\sqrt{8}}{\sqrt{-18}}\right)$

TB2. The product of four consecutive positive integers is 1 less than 461^2. What is the least of these four numbers?

TB3. Four cubes of volumes 1 cm^3, 8 cm^3, 27 cm^3, and 125 cm^3 are glued together at their faces. What is the number of square centimeters in the smallest possible surface area of the resulting solid figure?