Cindy D. Wright Mathematics Tournament 2014
Eighth Grade Written

1. Solve for n: $9n-4(3n-2)=4$

A. $n=\frac{4}{3}$ B. $n=-\frac{4}{3}$ C. $n=-4$ D. $n=4$ E. NOTA

2. Evaluate $-8^0(2^x)(10^y)$ when $x=-2$ and $y=-3$

A. $-\frac{1}{4000}$ B. $-\frac{1}{500}$ C. $\frac{1}{500}$ D. $\frac{1}{4000}$ E. NOTA

3. If $x=-2$ is a solution of $x^2-bx-16=0$, what is the value of b?

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

4. Tris is making Dauntless chocolate cake. The recipe calls for 3 ½ cups of sugar when using 3 eggs. If Tris were to use 7 eggs how many cups of sugar would she use?

A. 5 B. $7\frac{1}{2}$ C. $5\frac{5}{6}$ D. $8\frac{1}{6}$ E. NOTA

5. Twelve-thirteenths times two-thirds is equal to what number times four-ninths?

A. $\frac{18}{13}$ B. $\frac{13}{18}$ C. $\frac{32}{117}$ D. $\frac{117}{32}$ E. NOTA

6. If $4f-g=10$ and $4f+g=12$ find $16f^2-g^2$

A. –2 B. 120 C. 22 D. 2 E. NOTA

7. If the probability of an event is $\frac{3}{11}$, what are the odds in favor of the event?

A. $\frac{8}{11}$ B. $\frac{11}{8}$ C. $\frac{8}{3}$ D. $\frac{3}{8}$ E. NOTA

8. Simplify $6(3-7)\div(-2)^3\div(-1)$

A. 3 B. 4 C. –3 D. –4 E. NOTA

9. If Robert can type a word every 1.5 seconds, how many words can he type in 1 ½ hours?

A. 3600 B. 40 C. 360 D. 36 E. NOTA

10. If $12h-15k=7\frac{1}{4}$, then find $3k-2\frac{2}{5}h$

A. $1\frac{9}{20}$ B. 35 C. $-1\frac{9}{20}$ D. -35 E. NOTA

11. A 25 foot ladder is placed against a vertical wall of a building. The foot of the ladder is 7 feet from the base of the building. If the top of the ladder slips 4 feet, then the foot of the ladder will slide:

A. 15 ft. B. 5 ft. C. 4 ft. D. 8 ft. E. NOTA

12. What is the slope of a line perpendicular to the line represented by the equation $3x-6y=12$?

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

13. An amusement park has 27 different rides. If you have 21 ride tickets, how many different combinations of rides can you take?

A. 567 B. 2,320 C. 296,010 D. 112,480 E. NOTA

14. Simplify: $\left(-5x^{-2}\right)^3 x^7$

A. $-125x^8$ B. $-125x$ C. $125x^8$ D. $125x$ E. NOTA

15. If 64 is divided into three parts proportional to 2, 4 and 6, find the smallest part.

A. $\frac{16}{3}$ B. 11 C. $\frac{32}{3}$ D. 5 E. NOTA

16. The fraction $\frac{37}{13}$ can be written in the form $2+\cfrac{1}{x+\cfrac{1}{y+\cfrac{1}{z}}}$. Find (x,y,z) where x, y, and z are natural numbers.

A. (11, 2, 5) B. (1, 5, 2) C. (5, 2, 11) D. (1, 2, 5) E. NOTA

17. Mr. Morris has \$10,000 to invest. He invests \$4,000 at 5% and \$3,500 at 4%. What percentage must he invest the remainder at to have a yearly income of \$500?

A. 6.1% B. 6.2% C. 6.3% D. 6.4% E. NOTA

18. Which matrix is the solution matrix for the linear system $\begin{aligned} -x+5y &= -23 \\ 4x-2y &= 20 \end{aligned}$

A. $\begin{bmatrix} -3 \\ 4 \end{bmatrix}$ B. $\begin{bmatrix} 3 \\ -4 \end{bmatrix}$ C. $\begin{bmatrix} -3 \\ -4 \end{bmatrix}$ D. $\begin{bmatrix} -4 \\ 3 \end{bmatrix}$ E. NOTA

19. The distance that a free falling object travels varies directly as the square of time it has been falling. When Katniss shoots the arrow into the force field, the force field falls 320 *m* in 8 *s*. How far will it fall is 3 *s*?

A. 5 *m* B. 15 *m* C. 120 *m* D. 45 *m* E. NOTA

20. Find the minimum value of the expression $4x+3y$ over the region that has corner points (1,0), (3,0), (3,2), and (1,4).

A. 18 B. 12 C. 4 D. 16 E. NOTA

21. Find the fourth power of $\sqrt{1+\sqrt{1+\sqrt{1}}}$

A. $\sqrt{2}+\sqrt{3}$ B. $\frac{1}{2}\left(7+3\sqrt{5}\right)$ C. $1+2\sqrt{3}$ D. $3+2\sqrt{2}$ E. NOTA

22. Which function is the inverse of $f(x)=\frac{1}{4}x^3+1$

A. $f^{-1}(x)=\sqrt[3]{x-1}$ B. $f^{-1}(x)=\sqrt[3]{4x-4}$ C. $f^{-1}(x)=\sqrt[3]{4x-1}$ D. $f^{-1}(x)=\sqrt[3]{4x+4}$ E. NOTA

23. A reservoir can be filled in 6 days by pipe A running alone, or in 4 days by pipe B alone. How many days would be needed to fill the reservoir if both pipes were running?

A. $3\frac{1}{2}$ B. 5 C. $2\frac{2}{5}$ D. $\frac{5}{12}$ E. NOTA

24. Miley Cyrus' wrecking ball had a circumference of 20 *ft*. She had to increase the circumference to 25 feet for the MTV Music Award's show. How much did the radius increase by?

A. 5 *ft*. B. 2 ½ *ft*. C. $\frac{5}{\pi}$ *ft*. D. $\frac{5}{2\pi}$ *ft*. E. NOTA

25. The perimeter of a square is equal to a circle's circumference. Find the ratio of the area of the circle to the area of the square.

A. $\frac{4}{\pi}$ B. $\frac{\pi}{4}$ C. $\frac{\pi}{\sqrt{2}}$ D. $\frac{\sqrt{2}}{\pi}$ E. NOTA

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

TB1. Simplify: $216^{0.\overline{3}} + 625^{1/4} - 89(\sqrt{49} - 7)$

TB2. If x is equal to the probability of rolling a prime number on a fair octagonal die, and y is equal to the probability of drawing a spade from a deck of fair cards, then what is the sum of the additive inverses of the reciprocals of x and y?

TB3. What is $3210_4 + 210_3 + 10_2$ in base ten?