## Cindy D. Wright Mathematics Tournament 2013 <br> Eighth Grade Written

1. Solve for $n: \quad 2 n \quad \frac{5}{6}=\frac{3}{4} n$
A. $n=\frac{10}{7}$
B. $n=5$
C. $n=\frac{2}{3}$
D. $n=\frac{10}{21}$
E. NOTA
2. Allan read 56 pages in 3 hours. At that same rate, find the number of hours it will take him to read the remaining 140 pages.
A. $7 \frac{1}{2}$
B. $2613 \frac{1}{3}$
C. 28
D. $10 \frac{1}{2}$
E. NOTA
3. If $x^{3} 7 x^{2}+4 x \quad 28$ is factored completely, one of the factors is:
A. $x+2$
B. $x+7$
C. $x^{2}+7$
D. $x^{2}+4$
E. NOTA
4. If $x=$ the GCF of 16,20 , and 72 and $y=$ the LCM of 16,20 , and 72 , what is $x y$ ?
A. 2880
B. 4
C. 720
D. 724
E. NOTA
5. The circumferences of two circles are 18 and 10 . Find the positive difference between the areas of these circles.
A. 14
B. 56
C. $\frac{56}{}$
D. $56^{3}$
E. NOTA
6. P is the midpoint of line segment AB . If A has coordinates $(7,1)$ and P has coordinates of $(-3,-9)$, what are the coordinates of B?
A. $(2,-4)$
B. $(-13,-19)$
C. $(17,11)$
D. $(4,-8)$
E. NOTA
7. What is the value in scientific notation of $\frac{2.88 \quad 10^{3}}{2.410^{7}}$
A. $0.48 \quad 10^{4}$
B. $1.210^{4}$
C. $1.210^{10}$
D. $0.48 \quad 10^{10}$
E. NOTA
8. Solve for $q$ : $\quad\binom{5}{$\hline}$=q+3$.
A. 4
B. identity
C. no solution
D. 4
E. NOTA
9. Find the equation in standard form of the line having slope of $-1 / 4$ and $y$-intercept of 10 .
A. $x+4 y=10$
B. $x+4 y=40$
C. $2 x+8 y=5$
D. $4 x+y=10$
E. NOTA
10. How many kilograms of salt must be added to 24 kg of a $20 \%$ salt solution in order to increase the concentration of salt to $40 \%$ ?
A. 8 kg
B. 12 kg
C. 4.8 kg
D. 12.8 kg
E. NOTA
11. Express $\frac{s^{2}}{r^{1}} \frac{s^{2}}{r^{3}} \div$ in simplest form without negative or zero exponents.
A. $r^{4} s^{4}$
B. $\frac{s^{4}}{r^{4}}$
C. $\frac{r^{4}}{s^{4}}$
D. $\frac{s^{4}}{r^{2}}$
E. NOTA
12. Simplify: $4 a^{2}+\frac{1}{2} b{ }_{-}^{2}$
A. $16 a^{4}+\frac{1}{4} b^{2}$
B. $16 a^{4}+b^{2}$
C. $16 a^{4}+9 a^{2} b+b^{2}$
D. $16 a^{4}+4 a^{2} b+\frac{1}{4} b^{2}$
E. NOTA
13. Because the math team students have gotten so out of control, Mrs. Cato decides to hold her very own "The Cato Games". There are 7 girls and 13 boys on the math team. Since there are more boys, Mrs. Cato has decided that more boys than girls will be sacrificed. In how many different ways can you pick a group of 5 girls and 10 boys for the Cato Games?
A. 3603600
B. 15504
C. 72072
D. 6006
E. NOTA
14. Simplify $\begin{array}{llll}4^{3} & 3^{2} & 2^{3} & (1)^{3}\end{array}$
A. -4
B. 4
C. 32
D. -32
E. NOTA
15. Solve: $\left|3 p \quad \frac{3}{5}\right|>\frac{6}{5}$
A. $\frac{1}{5}<p<\frac{3}{5}$
B. $\frac{1}{5}<p<\frac{3}{5}$
C. $p>\frac{3}{5}$ or $p<\frac{1}{5}$
D. $p<\frac{3}{5}$ or $p>\frac{1}{5}$
E. NOTA
16. Six people can build half a bridge in 4 days. How long would it take four people to build an entire bridge if each person works at the same rate?
A. 6
B. 3
C. 1
D. 12
E. NOTA
17. Lynn and Shirley are going shopping. They bought a dress for $\$ 10$. A week later, they sold it to the thrift store for $20 \%$ less than the original price. Two days later, the girls go back to the thrift store to buy the dress for $50 \%$ more than they sold it to them. How much money is the new price away from the original price?
A. $\$ 2$
B. $\$ 3$
C. $\$ 4$
D. $\$ 1$
E. NOTA
18. Solve $\frac{30}{d^{2}-9}+2=\frac{5}{d-3}$
A. $-\frac{1}{2}, 3$
B. $-\frac{1}{2}$
C. $-\frac{1}{2},-3$
D. $\frac{1}{2}, 3$
E. NOTA
19. $y$ varies directly as $a$ and inversely as $b$. If $y=10$ when $a=30$ and $b=4$, find $y$ when $a=48$ and $b=8$.
A. $\frac{9}{2}$
B. 8
C. $\frac{2}{9}$
D. 12
E. NOTA
20. How many thirteenths is $60 \%$ ?
A. $\frac{3}{65}$
B. $\frac{5}{39}$
C. $7 \frac{4}{5}$
D. $21 \frac{2}{3}$
E. NOTA
21. Given $4=\sqrt{\frac{7 k 10}{9}}$ and $15 \sqrt{2}=5 \sqrt{t}$, what is $k t$ ?
A. 22
B. 2
C. 18
D. 4
E. NOTA
22. If $(x+y)^{2}=18$ and $x y=6$, what is: $x^{2}+y^{2}$ ?
A. 12
B. $\sqrt{18}$
C. 6
D. $\sqrt{6}$
E. NOTA
23. In a right triangle, the hypotenuse has length 119 and one of the legs has a length of 105 . Find the perimeter of the triangle.
A. 280
B. 56
C. 161
D. $\sqrt{3136}+224$
E. NOTA
24. If $f(x)=(x+i)\left(\begin{array}{ll}x & i\end{array}\right)$ and $g(x)=x^{3}$, find $f(g(f(1)))$.
A. 8
B. 17
C. 65
D. $17 i^{2}+15 i^{4}+9 i^{8}$
E. NOTA
25. In a $3 \times 7$ array of dots, how many distinct triangles can be formed whose vertices are dots in the array?
A. 1200
B. 1330
C. 1320
D. 1201
E. NOTA

Tiebreakers Please write tiebreaker answers in the top margin on the back of the scantron.
TB1. What is the value of the square root of the sum of the exterior angles of a convex 200-gon? Express your answer in simplest radical form.

TB2. A commuter drives the same distance to work each day. He normally averages 40 mph . On this particular day, he was slowed down to an average of 20 mph for the first 4 miles. He had to average 44 mph during the remainder of the trip to arrive at the usual time. How many miles does he travel to work?

TB3. Add: $111_{2}+333_{4}+777_{8}=$ $\qquad$ $-2$

