

2023 UAB Middle School Math Tournament

7th Grade Division

Written Test

1. 60 minutes will be allowed to complete this examination. The proctor will keep time. Students must stay in the room for the full 60 minutes. If you must leave the room, you must turn in your scantron before leaving since reentry will not be permitted.
2. No calculators, books, notes, or other aides may be used. The proctor will supply scratch paper; you may not bring your own. If you need more scratch paper or a pencil during the test, raise your hand and the proctor will bring it to you.
3. You will receive 4 points for each correct answer and -1 for each incorrect answer on the 25 multiple choice questions. Questions left blank will be worth 0 points. There are 3 tie breakers at the end of the test. Correct answers on the tie breakers are worth 0.1 point. Your score on the written test will be the sum of the scores from the multiple choice and tie breaker sections. Please write tiebreakers in the appropriate spaces on your answer sheet.
4. If the correct answer is not listed a-d, then mark e. NOTA (None of the Above)
5. If there are ties after the scores are computed as described above, ties will be broken by comparing answers counting backwards from number 25, then 24, and so on, using these questions as tie breakers.
6. Please give the proctor your answer sheet before you leave the classroom. You may keep the copy of the test. We suggest that you mark your answers on this sheet as well so that you may check your answers outside of the testing rooms.

1. If you add two thirds and one eighth, take a fourth of that, and multiply it by seven and two fifths, what do you get ?
A) $\frac{551}{384}$
B) $\frac{703}{840}$
C) $\frac{703}{30}$
D) $\frac{37}{240}$
E) NOTA
2. 83 is 12% of what number?
A) 996
B) 589
C) 833
D) 691
E) NOTA
3. If $\frac{x}{y} = 13$ and $xy = 52$, what is the value of $x^2 - y^7$?
A) 652
B) 548
C) 773
D) 490
E) NOTA
4. Express 0.000000000000043 – 0.00000000000000982 in scientific notation.
A) 4.202×10^{-12}
B) 4.202×10^{-13}
C) 4.202×10^{-14}
D) 4.202×10^{-15}
E) NOTA
5. Solve $\frac{2x-3}{4} + 9 \geq 3 + \frac{4x}{3}$
A) $x \leq 63/10$
B) $x \leq 10/63$
C) $x \geq 63/10$
D) $x \geq -63/10$
E) NOTA
6. Find the median, mean, and range of the following set of numbers: 9, 18, 23, 32, 7, 88, 41, 27. If median = m, mean = e, and range = r, what is $r + m \times e$? Round your answer to the nearest whole number.

- A) 3286
- B) 763
- C) 2800
- D) 846
- E) NOTA

7. Oscar is shopping for shirts. Each shirt costs 9.35. However, there is a special offer of 4 shirts for 32.60. How much does he save per shirt if he uses the offer?

- A) \$2.04
- B) \$1.20
- C) \$3.22
- D) \$4.80
- E) NOTA

8. What is the probability of drawing a queen from a standard deck of cards (52) and rolling an even number and a 3 on a pair of dice?

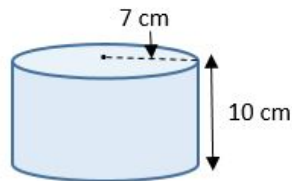
- A) $\frac{1}{156}$
- B) $\frac{1}{39}$
- C) $\frac{1}{108}$
- D) $\frac{1}{78}$
- E) NOTA

9. What is the 14th term of the sequence: 2, 4, 7, 14, 17...

- A) 727
- B) 634
- C) 617
- D) 754
- E) NOTA

10. Find the volume of the cylinder. Use 3.14 for π . Round to the nearest whole number.

- A) 1248 cm^2
- B) 440 cm^3
- C) 1539 cm^3
- D) 157 cm^2
- E) NOTA



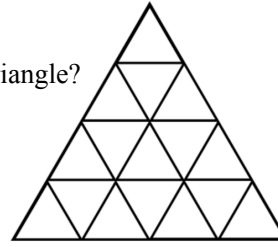
11. Factor the expression completely: $10x^2 + 16x + 6$

- A) $2(5x + 3)(x + 1)$
- B) $2x(5x + 11)$

- C) $2(5x^2 + 8x + 3)$
 D) $2(5x^2 + 1)(8x + 3)$
 E) NOTA

12. How many triangles can be made out of the following triangle?

- A) 23
 B) 20
 C) 28
 D) 25
 E) NOTA



13. How many ways can the letters of the word TOURNAMENT be arranged?

- A) 1814400
 B) 40320
 C) 161280
 D) 907200
 E) NOTA

14. $(\frac{3}{5} \div \frac{1}{8}) + (\frac{4}{9} \times \frac{7}{5}) - \frac{1}{3} = ?$

- A) $\frac{25}{21}$
 B) $\frac{229}{45}$
 C) $\frac{1507}{315}$
 D) $\frac{131}{360}$
 E) NOTA

15. In a group of 130 children, 25 like both chocolate and vanilla ice cream, 43 like vanilla, and 18 like only chocolate. How many children do not like either ice cream flavor?

- A) 44
 B) 62
 C) 69
 D) 87
 E) NOTA

16. Which of the following is an irrational number?

- A) $\sqrt{196}$
 B) 0^3
 C) $\frac{8}{21}$
 D) -7^4
 E) NOTA

17. Sixty-one of eighty-five horses are brown. What percentage of horses are brown? Round your answer to the nearest whole number.

- A) 72%
- B) 59%
- C) 61%
- D) 78%
- E) NOTA

18. What is the measurement of the larger angle formed by the hands of an analog clock showing 1:45 PM?

- A) 160°
- B) 240°
- C) 270°
- D) 190°
- E) NOTA

19. If you have paid off \$39 in interest for a loan of \$500 in a period of 6 months, what is the interest rate of the loan?

- A) 1.3%
- B) 0.95%
- C) 2.6%
- D) 6.4%
- E) NOTA

20. The width of a rectangle is a third of its length. If the length of the rectangle is increased by 3 inches and the width remains the same, the area of the rectangle increases 12 in^2 . What is the width of the rectangle?

- A) 5 in.
- B) 11 in.
- C) 8 in.
- D) 9 in.
- E) NOTA

21. Jason leaves an empty 6-gallon bucket outside and it starts to rain heavily. If it takes 7 minutes for 1 cup of water to fall in the bucket, how long would it take to fill the bucket if the rain falls at a constant rate?

- A) 6 hours and 45 minutes
- B) 9 hours and 28 minutes
- C) 10 hours and 34 minutes
- D) 11 hours and 12 minutes
- E) NOTA

22. What is the distance between the points (-2, 6) and (6, -9)?

- A) 14

- B) 17
- C) 15
- D) 19
- E) NOTA

23. The sum of the supplement and complement of an angle is 126. Find the measure of the angle.

- A) 68°
- B) 52°
- C) 72°
- D) 36°
- E) NOTA

24. Find the slope of a line that is perpendicular to the line that crosses the points (7, 14) and (-11, 8).

- A) $\frac{1}{3}$
- B) 2
- C) -3
- D) $-\frac{35}{3}$
- E) NOTA

25. Write the product of $4\frac{1}{3}$ and $2\frac{3}{5}$ as a mixed number.

- A) $11\frac{4}{15}$
- B) $7\frac{3}{20}$
- C) $11\frac{2}{6}$
- D) $7\frac{11}{26}$
- E) NOTA

TB1. What is the probability that after flipping a coin eight times and getting seven heads and one tail, you get a tail on the ninth flip?

TB2. What is $38^3 - 79^2$?

TB3. What is the 11th digit after the decimal in π ?

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Written Test Answer Key

1. B) $\frac{703}{840}$
2. D) 691
3. B) 548
4. C) 4.202×10^{-14}
5. A) $x \leq 63/10$
6. D) 846
7. B) \$1.20
8. A) $\frac{1}{156}$
9. B) 634
10. C) 1539 cm^3
11. A) $2(5x + 3)(x + 1)$
12. E) NOTA
13. D) 907200
14. B) $\frac{229}{45}$
15. C) 69
16. E) NOTA
17. A) 72%
18. B) 240°
19. A) 1.3%
20. E) NOTA
21. D) 11 hours and 12 minutes
22. B) 17
23. C) 72°
24. C) -3
25. A) $11\frac{4}{15}$

TB1. 1/2

TB2. 48631

TB3. 8