T M S C A E L E M E N T A R Y
M A T H E M A T I C S
S P R I N G O N - L I N E T E S T ©
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GENERAL DIRECTIONS

1. About this test:
   A. You will be given 40 minutes to take this test.
   B. There are 50 problems on this test.
2. All answers must be written on the answer sheet/Scantron form/Chatsworth card provided. If you are using an answer sheet be sure to use **BLOCK CAPITAL LETTERS**. Clean erasures are necessary for accurate grading on Scantrons and Chatsworth cards.
3. If you are using a Chatsworth or Scantron card, please follow the specific instructions given at your particular meet.
4. You may write anywhere on the test itself. You must write only answers on the answer sheet.
5. You may use additional scratch paper provided by the contest director.
6. All problems have **ONE** and **ONLY ONE** correct [BEST] answer. There is a penalty for all incorrect answers.
7. Calculators **MAY NOT** be used on this test.
8. All problems answered correctly are worth **FIVE** points. **TWO** points will be deducted for all problems answered incorrectly. No points will be added or subtracted for problems not answered.
9. In case of ties, percent accuracy will be used as a tie breaker.

2021 TMSCA Elementary School Mathematics Spring On-Line Test

1. $87 + 96 =$ _____
A. 183 B. 173 C. 11 D. 111 E. 171

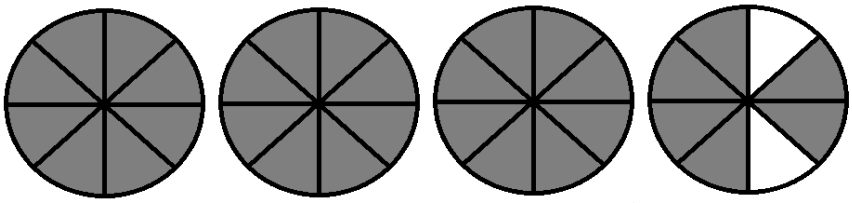
2. $82 - 47 =$ _____
A. 45 B. 35 C. 129 D. 119 E. 55

3. $56 \times 7 =$ _____
A. 312 B. 352 C. 282 D. 392 E. 382

4. $174 \div 6 =$ _____
A. 49 B. 29 C. 168 D. 180 E. 32

5. What digit is in the thousandths place in the number 856.314?
A. 4 B. 1 C. 3 D. 8 E. 5

6. What number can be represented by the shaded region in the picture below?



A. $\frac{3}{4}$ B. $3\frac{1}{2}$ C. $3\frac{1}{4}$ D. $3\frac{5}{8}$ E. $3\frac{3}{4}$

7. What number below is three less than twice as much as 24?
A. 27 B. 31 C. 51 D. 45 E. 42

8. In 9 minutes, it will be half-way between 3:00 pm and 3:16 pm. What time is it now?
A. 2:59 pm B. 2:57 pm C. 3:01 pm D. 3:03 pm E. 3:25 pm

9. Which expressions produce an equal value?
I. 76 – 27 II. 54 + 16 III. 61 + 13 IV. 33 + 41
A. I and II B. I and III C. I and IV D. II and III E. III and IV

10. How many gallons does 52 quarts make?
A. 16 B. 15 C. 14 D. 13 E. 12

11. Walker found a box. Inside the box were 8 packages of pencil erasers. If each package contained 24 erasers, how many pencil erasers did Walker find?
A. 148 B. 192 C. 212 D. 208 E. 186

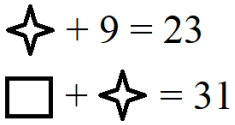
12. $53 - 16 - 7 = 19 + 10 +$ _____
A. 5 B. 2 C. 4 D. 3 E. 1

13. Eric drove buy a farm and counted a total of 82 legs that belonged to chickens and cows. If Eric counted 14 cows, how many chickens did he count?
A. 26 B. 24 C. 17 D. 13 E. 9

14. What is the sum of the digits of the sum of 28 and 72?
A. 14 B. 10 C. 19 D. 1 E. 9

15. What is the next number in the sequence? 17, 86, 27, 76, 37, 66, 47, 56, …
A. 46 B. 67 C. 127 D. 86 E. 57

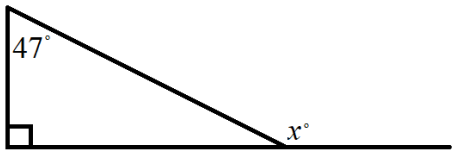
16. Which number should replace the rectangle below?



A. 15 B. 21 C. 17 D. 19 E. 23

17. \$6.28 = 18 quarters + _____ dimes + 13 nickels + 23 pennies
A. 12 B. 11 C. 10 D. 9 E. 8

18. What is the value of *x* in the picture below?



A. 43 B. 86 C. 172 D. 129 E. 137

19. What is the difference of the largest prime number and least prime number between the numbers 30 and 50?
A. 78 B. 20 C. 16 D. 28 E. 22

20. What is the remainder when the number 5,317,922 is divided by 9?
A. 5 B. 3 C. 7 D. 6 E. 2

21. 2,300 kilograms = _____ centigrams
A. 230,000,000 B. 2.3 C. 0.023 D. 23,000,000 E. 23

22. What is the prime factorization of the number 1,200?
A. $2^3 \times 3^2 \times 5^2$ B. $2^4 \times 3 \times 5^2$ C. $2^3 \times 3^3 \times 5^3$ D. $2^4 \times 3^2 \times 5$ E. $2 \times 3^4 \times 5$

23. 32 marbles are placed evenly into 8 piles. How many marbles are needed to make 20 piles, all with the same number of marbles in them?
A. 160 B. 120 C. 100 D. 80 E. 60

24. If $a \blacklozenge b = ab \div 4 + 7$, what is the value of $6 \blacklozenge 8$?
A. 21 B. 14 C. 19 D. 28 E. 17

25. If $\pi = 3$, what is the area of a circle with a diameter of 30 cm?
A. 2,700 cm^2 B. 675 cm^2 C. 180 cm^2 D. 525 cm^2 E. 360 cm^2

26. What is the largest perfect square less than 400?
A. 361 B. 393 C. 441 D. 324 E. 399

27. What is the name of a polygon that has 12 sides?
A. undecagon B. decagon C. heptagon D. septagon E. dodecagon

28. 13 cups = _____ fluid ounces
A. 106 B. 104 C. 98 D. 96 E. 88

29. 94×67 = _____

A. 6,218 B. 6,138 C. 6,328 D. 6,298 E. 6,278

30. What is the multiplicative inverse of the difference of $\frac{5}{8} - \frac{2}{5}$?

A. $\frac{40}{9}$ B. $\frac{20}{3}$ C. 1 D. $\frac{1}{4}$ E. $1\frac{1}{4}$

31. What is the product of the GCF and LCM of the numbers 18 and 32?

A. 288 B. 594 C. 576 D. 558 E. 370

32. What is $\frac{59}{5}$ expressed as a mixed number?

A. $11\frac{3}{5}$ B. $11\frac{2}{5}$ C. $11\frac{9}{5}$ D. $11\frac{1}{5}$ E. $11\frac{4}{5}$

33. Ryan collected a pile of 212 acorns. A squirrel came along and took 32 acorns from the pile. A second squirrel came and took 103 acorns from the pile. How many acorns does Ryan have left in his pile?

A. 77 acorns B. 109 acorns C. 180 acorns D. 67 acorns E. 89 acorns

34. Which inequality is not true?

A. $\frac{3}{4} > \frac{1}{2}$ B. $\frac{4}{5} < \frac{5}{6}$ C. $\frac{1}{3} > \frac{1}{5}$ D. $\frac{3}{10} < \frac{1}{5}$ E. $\frac{3}{8} < \frac{3}{4}$

35. What is the sum of all the data points in the dot-plot below?

A. 34 B. 42 C. 38 D. 44 E. 36

36. What is 0.9% expressed as a decimal?

A. 0.9 B. 0.09 C. 0.009 D. 9.0 E. 90.0

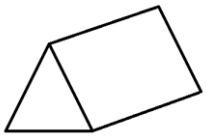
37. 484 = _____ (Roman numeral)

A. CCCCXXCIV B. CCCCXXCIV C. CDLXXXIV D. CDXXCIV E. CDLXXXIIII

38. $\sqrt{400} + \sqrt{289}$ = _____

A. $\sqrt{689}$ B. 13 C. 41 D. 29 E. 37

39. What is the sum of the number of faces, edges and vertices of the figure below?



A. 15 B. 14 C. 11 D. 20 E. 9

40. What is the supplement to the complement of an angle measuring 52°?

A. 142° B. 38° C. 132° D. 48° E. 152°

41. In a class of 24 students, 8 wear contacts. How many students are predicted to wear contacts in the school if there are a total of 384 students.
A. 128 B. 132 C. 124 D. 136 E. 140

42. Point *A* has coordinates (13, 17). What are the new coordinates of *A* after it is translated down 9 units?
A. (22, 26) B. (4, 17) C. (4, 26) D. (13, 8) E. (4, 8)

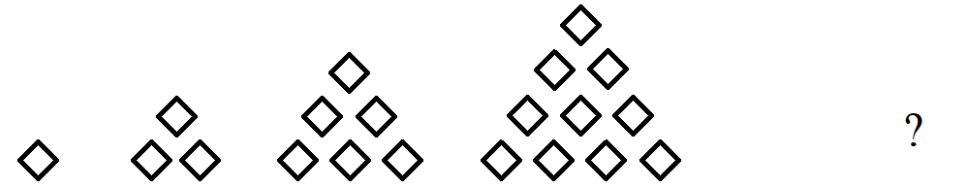
43. How many total degrees are there in a decagon?
A. $1{,}080^\circ$ B. $1{,}200^\circ$ C. $1{,}440^\circ$ D. $1{,}800^\circ$ E. 900°

44. What is the probability of drawing a 5, 8, or jack from a standard deck of cards?
A. $\frac{5}{26}$ B. $\frac{3}{13}$ C. $\frac{2}{13}$ D. $\frac{7}{26}$ E. $\frac{6}{13}$

45. Suzy scored a 78, 84, and 89 on her first three quizzes. What must Suzy score on her fourth quiz to have a quiz average of 85?
A. 85 B. 90 C. 93 D. 89 E. 91

46. $857 \times 923 =$ _____
A. 791,311 B. 791,071 C. 791,351 D. 791,211 E. 791,011

47. Using the pattern below, how many diamonds are needed to create Stage 8?

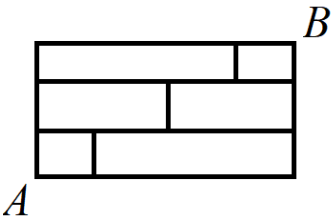


A. 45 B. 36 C. 28 D. 32 E. 42

48. How many total diagonals can be drawn inside of a regular octagon?
A. 10 B. 20 C. 40 D. 30 E. 50

49. Simplify: $-8 - 13 + (-6) + 22$
A. -5 B. 11 C. 7 D. -49 E. -27

50. Moving only up or to the right, how many paths are there from point *A* to point *B*?



A. 14 B. 13 C. 12 D. 11 E. 10

2021 TMSCA Elementary School Mathematics Spring On-Line Test Answer Key

1. A
2. B
3. D
4. B
5. A
6. E
7. D
8. A
9. C
10. D
11. B
12. E
13. D
14. D
15. E
16. C
17. D
18. E
19. C
20. E
21. A
22. B
23. D
24. C
25. B
26. A
27. E
28. B
29. D
30. A
31. C
32. E
33. A
34. D
35. B
36. C
37. C
38. E
39. D
40. A
41. A
42. D
43. C
44. B
45. D
46. E
47. B
48. B
49. A
50. E

2021 TMSCA Elementary School Mathematics Spring On-Line Test Selected Answers

8. Half-way between 3:00 pm and 3:16 pm is 3:08 pm. 9 minutes before this is 2:59 pm.

13. Eric counted 82 legs total. If Eric counted 14 cows, then $14 \times 4 = 56$ legs. If you subtract 56 legs from 82 legs, there are 26 legs remaining. Chickens have 2 legs, so $26 \div 2 = 13$ chickens.

14. The sum of 28 and 72 is 28 + 72 = 100. The sum of the digits of 100 is 1 + 0 + 0 = 1.

15. In the sequence 17, 86, 27, 76, 37, 66, 47, 56, …, 17 is the first term and 86 is the second term. To get each additional odd term, add 10 to the previous odd term. To get the next even term, subtract 10 from the previous even term. We are asked to find the next term, which is the 9^{th} term of the sequence. Since the 9^{th} term is odd, we will add 10 to the previous odd term, 47, to get 57.

20. To find the remainder when dividing a number by 9, add all the digits of the number and then subtract the highest power of 9 less than that sum. We are given the number 5,317,922. Find the sum of all the digits and get 5 + 3 + 1 + 7 + 9 + 2 + 2 = 29. The highest power of 9 less than 29 is 27. Therefore, the remainder when 5,317,922 is divided by 9 is 29 – 27 = 2.

23. If 32 marbles are placed into 8 piles, then each pile has $32 \div 8 = 4$ marbles in them. So, to make 20 piles of marbles with 4 marbles in each of them, we multiply 20 by 4 to get $20 \times 4 = 80$ marbles that are needed.

27. A polygon with 12 sides is called a dodecagon.

31. The product of the GCF and LCM of any two numbers is equal to the product of the two numbers. So, the product of the GCF and LCM of 18 and 32 is $18 \times 32 = 576$.

37. The number 484 in expanded form is 400 + 80 + 4. If 400 = CD, 80 = LXXX, and 4 = IV, then the number 484 = CDLXXXIV in Roman numerals.

38. $\sqrt{400} + \sqrt{289}$ = 20 + 17 = 37.

41. A proportion can be made to solve this problem. The proportion is $\frac{8}{24} = \frac{x}{384}$. We can simplify $\frac{8}{24}$ to $\frac{1}{3}$. Now our proportion is $\frac{1}{3} = \frac{x}{384}$. If $384 \div 3 = 128$, then $1 \times 128 = 128$. 128 students out of 384 are predicted to wear contacts.

45. You can make an equation to solve this problem. We are looking to find the average to come out to be 8, so the equation is $\frac{78+84+89+x}{4} = 85$. Simplify the numerator to get $\frac{251+x}{4} = 85$. Now, multiply both sides of the equation by 4, to get $251 + x = 340$. Subtract 251 from both sides to get x = 89. Suzy must score an 89 on her next quiz to have a quiz average of 85.