美国数学大联盟第一阶段活动真题

美国大联盟夏季挑战赛

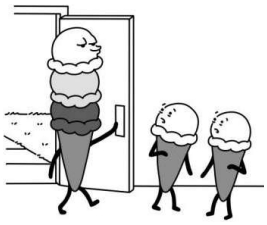
2022-2023 年度美国 Math League 思维探索第一阶段活动

（四年级）

（答题时间：75 分钟，总分：175 分）

学生诚信协议：答题期间，我确定没有就所涉及的问题或结论，与任何人、用任何方式交流或讨论，我确定我所填写的答案均为我个人独立完成的成果，否则愿接受本次成绩无效的处罚。

选择题：每小题 5 分，答对加 5 分，答错不扣分，共 175 分。



1. If each cone has 3 scoops of ice cream, 24 cones have _?_ scoops in total.

   A) 8　　B) 27　　C) 48　　D) 72

2. Eighteen pairs of shoes is 6 × _?_ shoes.

   A) 3　　B) 6　　C) 12　　D) 36

3. How many divisors of 2022 are multiples of 2?

   A) 1　　B) 2　　C) 3　　D) 4

4. If 10 days after my last birthday was a Tuesday, on what day of the week was my last birthday?

   A) Thursday　　B) Friday　　C) Saturday　　D) Sunday

5. The sum of the digits of a 3-digit whole number is 11. What is the greatest possible digit of this whole number?

   A) 3　　B) 4　　C) 8　　D) 9

6. If I missed the basket on every 3rd throw of 48 throws, I missed the basket _?_ times.

   A) 3　　B) 16　　C) 32　　D) 45

7. If the sum of the lengths of three sides of a square is 18, then the perimeter of the square is

   A) 6　　B) 24　　C) 36　　D) 72

8. The total number of hours in 20 days is _?_ more than 20 hours.

   A) 400 hours　　B) 456 hours　　C) 460 hours　　D) 476 hours

9. The greatest integer on a list of consecutive integers is 30 more than the smallest on the list. How many integers are on the list?

   A) 15　　B) 16　　C) 30　　D) 31

10. Each year, Ann saves 3 times as much money as she spends. If Ann saved $150 last year, how much more money did she save last year than she spent last year?

A) $50 B) $75 C) $100 D) $450

11. What is the greatest possible value of one of two primes whose product is less than 20?

A) 7 B) 11 C) 15 D) 19

12. Sue swam a total of 18 laps in 4 consecutive days. On each day she swam one more lap than on the day before. How many laps did Sue swim on the third day?

A) 4 B) 5 C) 17 D) 19

13. The smallest multiple of 6 that is 2 more than a multiple of 7 is

A) 24 B) 28 C) 30 D) 36

14. When I switch the order of the digits of a 2-digit integer, the new integer is 9 less than the original integer. The new integer could be

A) 12 B) 13 C) 14 D) 15

15. Kay counted to 72 by 2s. May counted to 72 by 3s. How many more numbers did Kay count than May counted?

A) 1 B) 12 C) 24 D) 36

16. How many factors of $1 \times 2 \times 3 \times 4 \times 5$ are factors of $1 \times 2 \times 3 \times 4$?

A) 3 B) 5 C) 6 D) 8

17. If the area and perimeter of a square with integer side-lengths are numerically equal, the product of the area and perimeter must be

A) 4 B) 16 C) 32 D) 256

18. A total of 480 kids wait on 8 equal lines to ride a rollercoaster. The first 3 kids from each line get on each ride. If no new kids get on any line, how many rides must run until each kid has ridden the rollercoaster?

A) 20 B) 24 C) 60 D) 180

19. The sum of the digits of the greatest 3-digit integer with one digit a multiple of 2, another a multiple of 3, and a 3rd digit a multiple of 5 is

A) 17 B) 18 C) 21 D) 22

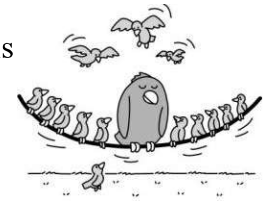
20. I have an equal number of nickels and quarters. The total value of these coins, in cents, is _?_ times the total number of these coins.

A) 5 B) 15 C) 20 D) 30

21. The number of days it rained in my town last year is the same number of days in an odd number of whole weeks. If it rained more than 100 days last year, the fewest days it could have rained is

A) 103 B) 105 C) 107 D) 109

22. Birds from a flock of 200 birds began landing on a 10 m-long wire. If the wire is divided into 50 cm-long sections and at most 8 birds can occupy each section, how many birds from the flock will not have room to land on the wire?



A) 0 B) 20 C) 40 D) 80

23. I wrote consecutive multiples of 6, starting with 6 and ending with 72. Which of the following is not a factor of any multiple I wrote?

A) 21 B) 22 C) 27 D) 28

24. My cat sleeps from midnight to 6 AM each day, and then he sleeps for 20 minutes of every 3 hours the rest of each day. What is the average number of minutes my cat sleeps per hour each day?

A) 10 B) 20 C) 30 D) 36

25. The sum of the 100 smallest even whole numbers greater than 0 is the product of what two numbers?

A) 100 & 25 B) 100 & 50 C) 100 & 100 D) 100 & 101

26. Sally went shelling. Every third shell Sally found was dirty. Every fourth shell she found was cracked. How many of the 84 shells Sally found were dirty but not cracked?

A) 7 B) 14 C) 16 D) 21

27. How many whole numbers greater than 99 and less than 1000 consist of exactly 2 different digits?

A) 243 B) 270 C) 297 D) 300

28. It cost me \$30 to buy 2 balls and 2 bats. At the same unit prices, it cost my sister \$65 for 5 balls and 4 bats. The cost of 1 bat is

A) \$5 B) \$10 C) \$15 D) \$20

29. The product of a 2-digit number and a 4-digit number may have _?_ digits.

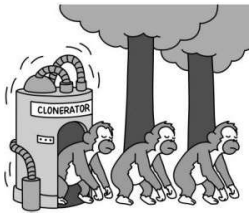
A) 6 B) 7 C) 8 D) 9

30. Cy and her 5 friends, all working at the same rate, can make a snowman in 30 minutes. If Cy and all her friends work at this same rate, the fewest number of friends needs to help Cy make a snowman in 20 minutes or less is

A) 6 B) 7 C) 8 D) 9

31. The four digits of 2022 can be arranged to create _?_ different 4-digit whole numbers.

A) 3 B) 4 C) 6 D) 12



32. The number of orangutans living in my tree increases by a constant number each year. If there are 40 orangutans now and there were 24 two years ago, how many orangutans will be in my tree in six years?

A) 64 B) 72 C) 88 D) 136

33. The greatest number of obtuse angles that a rhombus can have is

A) 1 B) 2 C) 3 D) 4

34. How many positive integers less than 60 have both 4 and 6 as factors?

A) 2 B) 3 C) 4 D) 5

35. The product of three whole numbers is 36. What could **not** be the sum of the three?

A) 10 B) 11 C) 12 D) 13

2022-2023 年度美国 Math League 思维探索第一阶段活动 四年级试卷答案										
题号	1	2	3	4	5	6	7	8	9	10
答案	**D**	**B**	**D**	**C**	**D**	**B**	**B**	**C**	**D**	**C**
题号	11	12	13	14	15	16	17	18	19	20
答案	**A**	**B**	**C**	**A**	**B**	**D**	**D**	**A**	**D**	**B**
题号	21	22	23	24	25	26	27	28	29	30
答案	**B**	**C**	**D**	**B**	**D**	**D**	**A**	**B**	**A**	**C**
题号	31	32	33	34	35					
答案	**A**	**C**	**B**	**C**	**C**					

Speed Questions, Grade 4
2022 Math League International Summer Challenge
(Unofficial version, for reference only)

Note:
Listed below are the four types of coins currently being minted in United States.

a. Penny: 1¢
b. Nickel: 5¢
c. Dime: 10¢
d. Quarter: 25¢

1. 21 × 22=
A) 43
B) 442
C) 462
D) 2122

2. What is the average of 1, 2, 3, 4, 5, 6, and 7?
A) 1
B) 4
C) 7
D) 10

3. I have 1 penny, 5 nickels, and 10 dimes. How much money do I have?
A) $1.25
B) $1.26
C) $1.50
D) $1.51

4. The *digital* sum for the year 2022 is $2 + 0 + 2 + 2$ or 6. How many years from 2023 to 2500 have a *digital* sum of 6?
A) 10
B) 12
C) 13
D) 14

5. 100% of 50 = 200% of ___?___

A) 25

B) 75

C) 100

D) 150

6. Of the following, which fraction does *not* equal $\frac{2}{3}$?

A) $\frac{22}{33}$

B) $\frac{4}{6}$

C) $\frac{18}{27}$

D) $\frac{40}{90}$

7. The sum of two whole numbers is 36. Their greatest possible product is

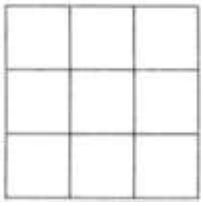
A) 35

B) 260

C) 320

D) 324

8. How many different rectangles does this diagram contain? (Count *all* rectangles, including squares.)



A) 18

B) 24

C) 36

D) 64

9. How many positive prime numbers have ones digit of 5?
A) 0
B) 1
C) 5
D) 25

10. If I start with $100, increase this by 50%, then decrease the new amount by 50%, how much money will I have?
A) $50
B) $66
C) $75
D) $100

11. Bob earned $33 in 6 days. At the same rate, Bob's total earnings should be $88 in how many more days?
A) 10
B) 14
C) 16
D) 22

12. Of the following whole numbers, which has the fewest number of factors?
A) 6
B) 8
C) 10
D) 11

13. $111111 + 222222 + 333333 + 444444 = 222222 \times \underline{\quad ? \quad}$
A) 1
B) 4
C) 5
D) 10

14. Round 0.999 to the nearest tenth.
A) 0.1

B) 0.9
C) 0.99
D) 1.0

15. Ozzie hid his head in the sand 98 hours after 11 P.M. Sunday. Ozzie hid his head on a

A) Tuesday
B) Wednesda
y
C) Thursday
D) Friday

16. The ones digit of the product $9 \times 9 \times 9 \times 9 \times 9 \times 9 \times 9 \times 9$ is
A) 1
B) 2
C) 9
D) 0

17. The number of zero-digits in 80500 is 3. If the product $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 \times 9 \times 10 = 3628800$, how many zero-digits are in the product $10 \times 20 \times 30 \times 40 \times 50 \times 60 \times 70 \times 80 \times 90 \times 100$?
A) 10
B) 11
C) 12
D) 13

18. $(200 + 199 + 198 + \cdots + 101) - (100 + 99 + \cdots + 1) = 100 \times$?

A) 99
B) 100
C) 199
D) 200

19. If I made a list of every seven-digit whole number greater than 1 million which has exactly six of its digits equal to 9, how many different numbers would be on my list?

A) 7
B) 9
C) 62
D) 63

20. If the sum of two whole numbers equals twice their difference, this sum cannot be

A) 222
B) 444
C) 888
D) 1000

21. All the following have 2, 3, 5, 6, 10, 15, and 30 as factors *except*

A) 543420
B) 85030
C) 72630
D) 53430

22. In a class of 30 students, exactly 7 have smart phones, exactly 15 have pocket calculators, and exactly 2 have both. How many of the 30 students have neither?

A) 10
B) 8
C) 6
D) 4

23. $(2\,m)-(1000\,mm)=$

A) 10 cm
B) 100 cm
C) 20 cm
D) 200 cm

24. A prime number multiplied by its reciprocal will *always* be
A) prime
B) 0
C) even
D) odd

25. Which of the following fractions is less than one-third?

A) $\frac{5}{14}$

B) $\frac{15}{46}$

C) $\frac{31}{90}$

D) $\frac{104}{309}$

26. In a class, the ratio of the number of boys to the number of girls is 2 to 3. The number of boys is what percent of the number of students in the entire class?
A) 20%
B) 40%
C) 60%
D) $66\frac{2}{3}\%$

27. Joan bought a painting for $10, sold it for $20, repurchased it for $30, then resold it for $40. Joan
A) broke even
B) made $20
C) lost $10
D) lost $20

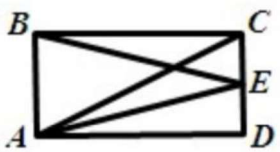
28. How much less is the area of a rectangular field 60 meters by 40 meters than that of a square field with the same perimeter?
A) 10 square meters
B) 100 square meters
C) 1000 square
meters
D) they're equal

29. Choice __?__ has more different prime factors than the other choices.
A) 1997
B) 1998
C) 1999
D) 2000

30. A clock is set correctly at 2 P.M. It loses 3 minutes every hour. What is the correct time when the clock reads 9 A.M. the next day?
A) 8 A.M.
B) 8:03
A.M.
C) 9:57
A.M.
D) 10 A.M.

31. Find the largest prime factor of $30 \times 40 \times 50$.
A) 3
B) 5
C) 10
D) 50

32. In the rectangle below, the area of triangle ABC is 12. What is the area of triangle ABE? (E is the midpoint of line segment CD.)



A) 18
B) 15
C) 12
D) 10

33. All the whole numbers with a first digit of 2 are written in increasing order. The list begins 2, 20, 21, 22, …Find the 1000th digit thus written.
A) 6
B) 7
C) 8
D) 9

34. My bicycle has a rear wheel whose diameter is 1.2 times as big as the diameter of the front wheel. As I ride my bicycle, if the front wheel turns 120 times, the rear wheel will turn
A) 96 times
B) 100 times
C) 120 times
D) 144 times

35. For any number N, let #(N) be the number of prime numbers less than or equal to N. What is #(8620) - #(8614)?
A) 0
B) 1
C) 2
D) 3

36. I multiplied one whole number by 18. I multiplied a second whole number by 21. I then added the two products. Of the following, which *could* have been the resulting sum?
A) 2020
B) 2021
C) 2022
D) 2023

37. The lengths of the sides of a triangle are 6, 8, and 10. The area of this triangle is
A) 24
B) 30
C) 40
D) 48

38. In a 10-team league, each team plays every other team exactly twice. Find the total number of games played in the league.
A) 45
B) 81
C) 90
D) 180

39. A man has 2 pennies, 3 nickels, 1 dime, and 2 quarters. How many different sums of money can he make using one or more of these 8 coins?
A) 8
B) 12
C) 47
D) 77

40. A pilot flew 80 km. He flew the first 4 minutes at half speed and the second 4 minutes at full speed. The full speed of the plane is
A) 400 km/hr
B) 600 km/hr
C) 800 km/hr
D) 1000 km/hr

41. A whole number is called an *increasing* number if each digit in the number is greater than the digit to its left. For example, 2359 is an increasing number. How many increasing numbers are there between 5000 and 10000?
A) 3
B) 4
C) 5
D) 6

42. $\sqrt{9}+\sqrt{16}=$

A) $\sqrt{5}$

B) $\sqrt{7}$

C) 5
D) 7
Answer: D

43. How many different three-digit numbers can be made using any three of the following five digits: 1, 2, 2, 3, and 3?
A) 12
B) 16
C) 18
D) 20

44. If B is the midpoint of $\overline{AC}$, and if C is the midpoint of $\overline{BD}$, then what percent of CD is AC?
A) 25%
B) 50%
C) 100%
D) 200%

45. At 3:30, the hands of an accurate school clock make an angle of
A) 90 degrees
B) 75 degrees
C) 65 degrees
D) 60 degrees

46. For what value of x will the sum of the numbers in each row, each column, and both major diagonals be equal in the "magic square" shown below?

13		4	

8	10	17	
	5	6	12
	x		9

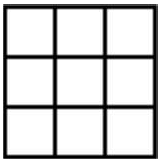
A) 14
B) 15
C) 16
D) 18

47. What is the 200th number in the sequence 1, 1, 1, 2, 1, 3, 1, 4, 1, 5,…?
A) 1
B) 100
C) 101
D) 200

48. What is the remainder when 10^{99} is divided by 9?

A) 0
B) 1
C) 2
D) 3

49. A square can be divided into 9 smaller congruent squares, as shown. By drawing different lines, it would be possible to divide this square into __?__ smaller congruent squares.



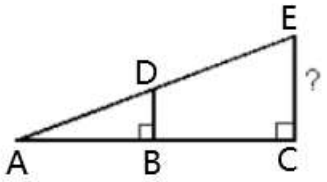
A) 70
B) 80
C) 90
D) 100

50. A man travels a distance of 20 miles at 60 miles per hour and then returns over the same route at 40 miles per hour. Find his average rate for the round trip in miles per hour.

A) 50
B) 48
C) 47
D) 46

51. How many whole numbers between 1 and 500 are divisible by 6 but are not divisible by 8?
A) 83
B) 73
C) 63
D) 53

52. What is the missing length in the diagram (which is not drawn to scale)?



AB = 9, BC = 18, BD = 6, CE= ?

A) 12
B) 15
C) 18
D) 21

53. Ann says “I never lie.” Bob says “Ann is not lying.” Carol says “Bob is lying.” Dan says “Carol is not lying.” If Bob is lying, how many of the other three must be lying?

A) 0
B) 1
C) 2
D) 3

54. What is the probability that, in its spelling (using all lowercase letters except the first one), a randomly chosen day of the week uses the letter "u"?

A) $\frac{2}{7}$

B) $\frac{3}{7}$

C) $\frac{4}{7}$

D) $\frac{5}{7}$

55. If the average of 2^{1999} and 2^{2001} is equal to the number of pirates who ever lived on Treasure Island, then how many pirates ever lived on Treasure Island?

A) 5×2^{1998}

B) 3×2^{1998}

C) 3×2^{1999}

D) 2^{2000}

56. After 5 tests, a student's average was 80. After taking an examination which counted as two test grades, his average dropped to 76. What was his grade on that examination?
A) 52
B) 66
C) 72
D) 76

57. A 12-hour clock loses 10 minutes each day. The clock will first return to the correct time in
A) 36 days
B) 72 days
C) 120 days
D) 144 days

58. In the correct addition below, A, B, and C are 3 different non-zero digits. Find the value of C.

$$\begin{array}{r} AB \\ +CC \\ \hline AAA \end{array}$$

A) 1
B) 9
C) 8
D) 7

59. Two cars are traveling in the same direction, one at 40 km/hr and the other at 50 km/hr. If the slower car is 15 km ahead of the faster car, how long will it take the faster car to catch up with the slower car?
A) 60 minutes
B) 75 minutes

C) 80 minutes
D) 90 minutes

60. A man has a 10 m × 10 m square garden. In the center is a 2 m × 2 m square patch which he can not use. He divides his usable space into four congruent rectangular patches, each of which measures
A) 3 m × 3 m
B) 8 m × 3 m
C) 4 m × 6 m
D) 2 m × 12 m

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Listed below are the four types of coins currently being minted in United States.

a. Penny: 1¢
b. Nickel: 5¢
c. Dime: 10¢
d. Quarter: 25¢

1. 21 × 22=
A) 43
B) 442
C) 462
D) 2122
Answer: C

2. What is the average of 1, 2, 3, 4, 5, 6, and 7?
A) 1
B) 4
C) 7
D) 10
Answer: B

3. I have 1 penny, 5 nickels, and 10 dimes. How much money do I have?
A) $1.25
B) $1.26
C) $1.50
D) $1.51
Answer: B

4. The *digital* sum for the year 2022 is $2 + 0 + 2 + 2$ or 6. How many years from 2023 to 2500 have a *digital* sum of 6?
A) 10
B) 12
C) 13
D) 14
Answer: B

5. 100% of 50 = 200% of ___?___

A) 25

B) 75

C) 100

D) 150

Answer: A

6. Of the following, which fraction does *not* equal $\frac{2}{3}$?

A) $\frac{22}{33}$

B) $\frac{4}{6}$

C) $\frac{18}{27}$

D) $\frac{40}{90}$

Answer: D

7. The sum of two whole numbers is 36. Their greatest possible product is

A) 35

B) 260

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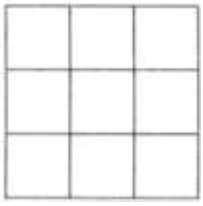
D) 324

Answer: D

8. How many different rectangles does this diagram contain? (Count *all* rectangles, including squares.)



A) 18

B) 24

C) 36

D) 64

Answer: C

9. How many positive prime numbers have ones digit of 5?
A) 0
B) 1
C) 5
D) 25
Answer: B

10. If I start with $100, increase this by 50%, then decrease the new amount by 50%, how much money will I have?
A) $50
B) $66
C) $75
D) $100
Answer: C

11. Bob earned $33 in 6 days. At the same rate, Bob's total earnings should be $88 in how many more days?
A) 10
B) 14
C) 16
D) 22
Answer: A

12. Of the following whole numbers, which has the fewest number of factors?
A) 6
B) 8
C) 10
D) 11
Answer: D

13. $111111 + 222222 + 333333 + 444444 = 222222 \times \underline{\quad ? \quad}$
A) 1
B) 4
C) 5
D) 10
Answer: C

14. Round 0.999 to the nearest tenth.
A) 0.1

B) 0.9
C) 0.99
D) 1.0
Answer: D

15. Ozzie hid his head in the sand 98 hours after 11 P.M. Sunday. Ozzie hid his head on a

A) Tuesday
B) Wednesday
C) Thursday
D) Friday
Answer: D

16. The ones digit of the product $9 \times 9 \times 9 \times 9 \times 9 \times 9 \times 9 \times 9$ is
A) 1
B) 2
C) 9
D) 0
Answer: A

17. The number of zero-digits in 80500 is 3. If the product $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 \times 9 \times 10 = 3628800$, how many zero-digits are in the product $10 \times 20 \times 30 \times 40 \times 50 \times 60 \times 70 \times 80 \times 90 \times 100$?
A) 10
B) 11
C) 12
D) 13
Answer: C

18. $(200 + 199 + 198 + \cdots + 101) - (100 + 99 + \cdots + 1) = 100 \times \ ?$
A) 99
B) 100
C) 199
D) 200
Answer: B

19. If I made a list of every seven-digit whole number greater than 1 million which has exactly six of its digits equal to 9, how many different numbers would be on my list?
A) 7
B) 9
C) 62
D) 63
Answer: C

20. If the sum of two whole numbers equals twice their difference, this sum cannot be
A) 222
B) 444
C) 888
D) 1000
Answer: A

21. All the following have 2, 3, 5, 6, 10, 15, and 30 as factors *except*
A) 543420
B) 85030
C) 72630
D) 53430
Answer: B

22. In a class of 30 students, exactly 7 have smart phones, exactly 15 have pocket calculators, and exactly 2 have both. How many of the 30 students have neither?
A) 10
B) 8
C) 6
D) 4
Answer: A

23. $(2\,m)-(1000\,mm)=$

A) 10 cm
B) 100 cm
C) 20 cm
D) 200 cm
Answer: B

24. A prime number multiplied by its reciprocal will *always* be
A) prime
B) 0
C) even
D) odd
Answer: D

25. Which of the following fractions is less than one-third?

A) $\frac{5}{14}$

B) $\frac{15}{46}$

C) $\frac{31}{90}$

D) $\frac{104}{309}$

Answer: B

26. In a class, the ratio of the number of boys to the number of girls is 2 to 3. The number of boys is what percent of the number of students in the entire class?
A) 20%
B) 40%
C) 60%

D) $66\frac{2}{3}\%$

Answer: B

27. Joan bought a painting for $10, sold it for $20, repurchased it for $30, then resold it for $40. Joan
A) broke even
B) made $20
C) lost $10
D) lost $20

Answer: B

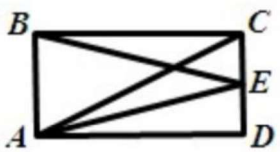
28. How much less is the area of a rectangular field 60 meters by 40 meters than that of a square field with the same perimeter?
A) 10 square meters
B) 100 square meters
C) 1000 square meters
D) they're equal
Answer: B

29. Choice __?__ has more different prime factors than the other choices.
A) 1997
B) 1998
C) 1999
D) 2000
Answer: B

30. A clock is set correctly at 2 P.M. It loses 3 minutes every hour. What is the correct time when the clock reads 9 A.M. the next day?
A) 8 A.M.
B) 8:03 A.M.
C) 9:57 A.M.
D) 10 A.M.
Answer: D

31. Find the largest prime factor of $30 \times 40 \times 50$.
A) 3
B) 5
C) 10
D) 50
Answer: B

32. In the rectangle below, the area of triangle ABC is 12. What is the area of triangle ABE? (E is the midpoint of line segment CD.)



A) 18
B) 15
C) 12
D) 10
Answer: C

33. All the whole numbers with a first digit of 2 are written in increasing order. The list begins 2, 20, 21, 22, …Find the 1000th digit thus written.
A) 6
B) 7
C) 8
D) 9
Answer: A

34. My bicycle has a rear wheel whose diameter is 1.2 times as big as the diameter of the front wheel. As I ride my bicycle, if the front wheel turns 120 times, the rear wheel will turn
A) 96 times
B) 100 times
C) 120 times
D) 144 times
Answer: B

35. For any number N, let #(N) be the number of prime numbers less than or equal to N. What is #(8620) - #(8614)?
A) 0
B) 1
C) 2
D) 3
Answer: A

36. I multiplied one whole number by 18. I multiplied a second whole number by 21. I then added the two products. Of the following, which *could* have been the resulting sum?
A) 2020
B) 2021
C) 2022
D) 2023
Answer: C

37. The lengths of the sides of a triangle are 6, 8, and 10. The area of this triangle is
A) 24
B) 30
C) 40
D) 48
Answer: A

38. In a 10-team league, each team plays every other team exactly twice. Find the total number of games played in the league.
A) 45
B) 81
C) 90
D) 180
Answer: C

39. A man has 2 pennies, 3 nickels, 1 dime, and 2 quarters. How many different sums of money can he make using one or more of these 8 coins?
A) 8
B) 12
C) 47
D) 77
Answer: C

40. A pilot flew 80 km. He flew the first 4 minutes at half speed and the second 4 minutes at full speed. The full speed of the plane is
A) 400 km/hr
B) 600 km/hr
C) 800 km/hr
D) 1000 km/hr
Answer: C

41. A whole number is called an *increasing* number if each digit in the number is greater than the digit to its left. For example, 2359 is an increasing number. How many increasing numbers are there between 5000 and 10000?
A) 3
B) 4
C) 5
D) 6
Answer: C

42. $\sqrt{9}+\sqrt{16}=$

A) $\sqrt{5}$

B) $\sqrt{7}$

C) 5
D) 7
Answer: D

43. How many different three-digit numbers can be made using any three of the following five digits: 1, 2, 2, 3, and 3?
A) 12
B) 16
C) 18
D) 20
Answer: C

44. If B is the midpoint of $\overline{AC}$, and if C is the midpoint of $\overline{BD}$, then what percent of CD is AC?
A) 25%
B) 50%
C) 100%
D) 200%
Answer: D

45. At 3:30, the hands of an accurate school clock make an angle of
A) 90 degrees
B) 75 degrees
C) 65 degrees
D) 60 degrees
Answer: B

46. For what value of x will the sum of the numbers in each row, each column, and both major diagonals be equal in the "magic square" shown below?

13		4	

8	10	17	
	5	6	12
	x		9

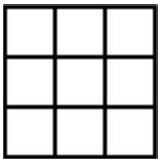
A) 14
B) 15
C) 16
D) 18
Answer: C

47. What is the 200th number in the sequence 1, 1, 1, 2, 1, 3, 1, 4, 1, 5,…?
A) 1
B) 100
C) 101
D) 200
Answer: B

48. What is the remainder when 10^{99} is divided by 9?

A) 0
B) 1
C) 2
D) 3
Answer: B

49. A square can be divided into 9 smaller congruent squares, as shown. By drawing different lines, it would be possible to divide this square into __?__ smaller congruent squares.



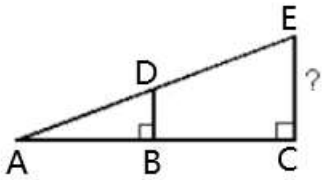
A) 70
B) 80
C) 90
D) 100

Answer: D

50. A man travels a distance of 20 miles at 60 miles per hour and then returns over the same route at 40 miles per hour. Find his average rate for the round trip in miles per hour.
A) 50
B) 48
C) 47
D) 46
Answer: B

51. How many whole numbers between 1 and 500 are divisible by 6 but are not divisible by 8?
A) 83
B) 73
C) 63
D) 53
Answer: C

52. What is the missing length in the diagram (which is not drawn to scale)?



AB = 9, BC = 18, BD = 6, CE= ?

A) 12
B) 15
C) 18
D) 21
Answer: C

53. Ann says “I never lie.” Bob says “Ann is not lying.” Carol says “Bob is lying.” Dan says “Carol is not lying.” If Bob is lying, how many of the other three must be lying?

A) 0
B) 1
C) 2
D) 3
Answer: B

54. What is the probability that, in its spelling (using all lowercase letters except the first one), a randomly chosen day of the week uses the letter “u”?

A) $\frac{2}{7}$

B) $\frac{3}{7}$

C) $\frac{4}{7}$

D) $\frac{5}{7}$

Answer: C

55. If the average of 2^{1999} and 2^{2001} is equal to the number of pirates who ever lived on Treasure Island, then how many pirates ever lived on Treasure Island?

A) 5×2^{1998}

B) 3×2^{1998}

C) 3×2^{1999}

D) 2^{2000}

Answer: A

56. After 5 tests, a student's average was 80. After taking an examination which counted as two test grades, his average dropped to 76. What was his grade on that examination?
A) 52
B) 66
C) 72
D) 76
Answer: B

57. A 12-hour clock loses 10 minutes each day. The clock will first return to the correct time in
A) 36 days
B) 72 days
C) 120 days
D) 144 days
Answer: B

58. In the correct addition below, A, B, and C are 3 different non-zero digits. Find the value of C.

$$\begin{array}{r} AB \\ +CC \\ \hline AAA \end{array}$$

A) 1
B) 9
C) 8
D) 7
Answer: B

59. Two cars are traveling in the same direction, one at 40 km/hr and the other at 50 km/hr. If the slower car is 15 km ahead of the faster car, how long will it take the faster car to catch up with the slower car?
A) 60 minutes
B) 75 minutes

C) 80 minutes
D) 90 minutes
Answer: D

60. A man has a 10 m × 10 m square garden. In the center is a 2 m × 2 m square patch which he can not use. He divides his usable space into four congruent rectangular patches, each of which measures
A) 3 m × 3 m
B) 8 m × 3 m
C) 4 m × 6 m
D) 2 m × 12 m
Answer: C