Sixth Grade Test - Excellence in Mathematics Contest – 2013

1. Tony has coins worth $3.60 in his pocket. He has 7 quarters, 11 dimes, and the rest of his coins are nickels. How many nickels does he have?

   A. 13 B. 15 C. 17 D. 21 E. 25

2. An adult human sleeps about 1/3 of each day. An adult lion sleeps about 3/4 of each day. How many more hours per day does the lion sleep than the human?

   A. 8 B. 9 C. 10 D. 11 E. 12

3. Laura can paint plywood at a rate of 3.2 square feet per minute. How many minutes does it take her to paint both sides of a 4 foot by 8 foot piece of plywood?

   A. 7.5 B. 10 C. 12.5 D. 15 E. 20

4. How many of these five fractions are between 1.5 and 2?

$$\frac{7}{8} \qquad \frac{7}{4} \qquad \frac{7}{5} \qquad \frac{4}{3} \qquad \frac{23}{15}$$

   A. 1 B. 2 C. 3 D. 4 E. 5

5. On this calendar for March, 2013, what is the sum of all of the shaded dates?

MARCH, 2013						
SUN	**MON**	**TUE**	**WED**	**THUR**	**FRI**	**SAT**
					1	**2**
3	**4**	**5**	**6**	**7**	**8**	**9**
10	**11**	**12**	**13**	**14**	**15**	**16**
17	**18**	**19**	**20**	**21**	**22**	**23**
24	**25**	**26**	**27**	**28**	**29**	**30**
31						

   A. 240 B. 255 C. 270 D. 285 E. 300

6. The product of two natural numbers is 72. The difference of these two numbers is 14. What is the sum of these two numbers?

   A. 17 B. 18 C. 22 D. 24 E. 27

7. What is the sum of the least and the greatest of these five numbers: $0;\quad 0.2;\quad -0.3;\quad -0.04;\quad 0.08$

   A. 0.16 B. 0.08 C. 0.04 D. 0.2 E. -0.1

8. It is now 4:48 PM. What time will it be in 152 minutes?

   A. 6:00 PM B. 6:40 PM C. 6:50 PM D. 7:10 PM E. 7:20 PM

9. The first three numbers in an arithmetic sequence are: **97; 82; 67;.....**
   What is the tenth number in this sequence?

   A. -53 B. -52 C. -38 D. -37 E. -32

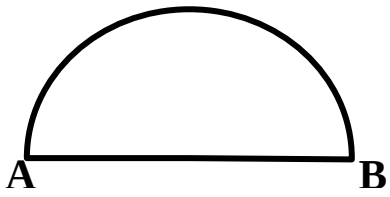
10. One new oil well in North Dakota required 10,560 feet of steel pipe. Each segment of the pipe was 32 feet long and weighed ¼ of a ton. (1 ton = 2000 pounds)
How many pounds of steel were used for this one oil well?

A. 84,480 B. 124,000 C. 165,000 D. 660,000 E. 2,640,000

11. Of 162 Eighth graders, 80% of the 90 girls and 75% of the boys are taking Algebra I.
How many of these Eighth graders are taking Algebra I?

A. 121 B. 126 C. 130 D. 132 E. 135

12. To protect his semi-circular vegetable garden from deer, Doug must fence all sides with a high fence.
If the length of AB is 30 feet, how many feet of fence will Doug use?
Round your answer to the nearest foot.



A. 72 B. 77 C. 94

D. 124 E. 353

13. It cost 7.5 cents to make one color copy. How many color copies can you make for $18.00?

A. 24 B. 135 C. 240 D. 1350 E. 2400

14. The perimeter of a rectangle is 40 cm. If its width is 6 cm, what is the area of the rectangle?

A. 84 cm^2 B. 100 cm^2 C. 102 cm^2 D. 168 cm^2 E. 204 cm^2

15. On this calendar for March, 2013, 16 numbers have been shaded. Circle any four of those 16 numbers so that <u>exactly one number from each row and exactly one number from each column have been circled</u>.

MARCH, 2013						
SUN	**MON**	**TUE**	**WED**	**THUR**	**FRI**	**SAT**
					1	**2**
3	**4**	**5**	**6**	**7**	**8**	**9**
10	**11**	**12**	**13**	**14**	**15**	**16**
17	**18**	**19**	**20**	**21**	**22**	**23**
24	**25**	**26**	**27**	**28**	**29**	**30**
31						

What is the largest possible sum of any four numbers you could circle?

A. 72 B. 76 C. 80 D. 104 E. 114

16. Given 5 nickels and 3 pennies, how many different amounts of money can be formed using one or more of these 8 coins?

A. 16 B. 18 C. 20 D. 23 E. 24

17. What is the sum of the prime factors of 2013?

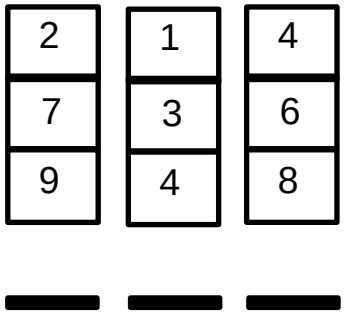
A. 75 B. 76 C. 674 D. 675 E. 2014

18. Follow this set of directions:
    1. Select any three different natural numbers between 0 and 10 to use as digits.
    2. Write all **six** 3-digit numbers that can be written with your three digits.
    3. Add those six numbers.
    4. Divide the sum in Part 3 by the sum of the three digits you originally chose in Part 1.

What is your result?

A. 111 B. 222 C. 333 D. 444 E. 555

19. Form a 3-digit whole number by selecting one digit from each column, in the order given. For example, you can form 718 or 214.



How many different 3-digit multiples of 9 are possible?

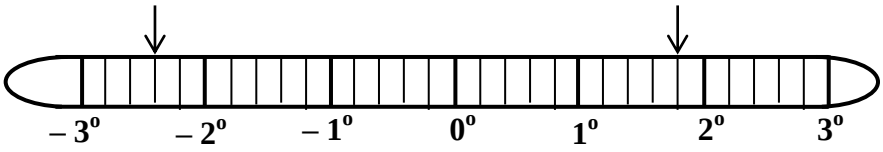
A. 1 B. 2 C. 3

D. 4 E. 5

20. The stronger Goldbach conjecture states that any even number greater than 7 can be written as the sum of two different prime numbers. In how many ways can 30 be written as the sum of two different prime numbers?

A. 1 B. 2 C. 3 D. 4 E. 5

21. The marks on this thermometer are equally spaced.



What is the positive difference in temperature between the two marks?

A. 2.7^{o} B. 3.6^{o} C. 4.2^{o} D. 4.7^{o} E. 5.4^{o}

22. How many natural numbers between 1 and 100 are divisible by both 4 and 6?

A. 4 B. 8 C. 12 D. 24 E. 40

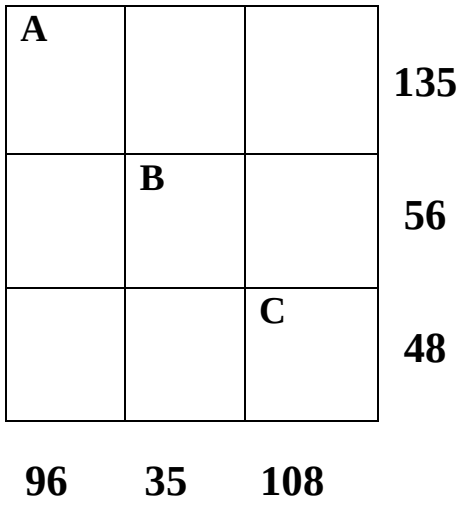
23. Each term in this sequence is the sum of the previous two terms. "**11**" is the first term of this sequence. What is the 10^{th} term?

1^{st} Term **10^{th} Term**

11; -7; 4; -3; _____; _____; _____; _____; _____; _____

A. – 17 B. – 7 C. – 1 D. 4 E. 5

24. Place the nine numbers: **1; 2; 3; 4; 5; 6; 7; 8; 9;** into the nine squares of this 3x3 grid using each number exactly once. The **product** of the three numbers in each row and the **product** of the three numbers in each column are given.



What is the sum of the numbers in the three squares marked A, B, and C?

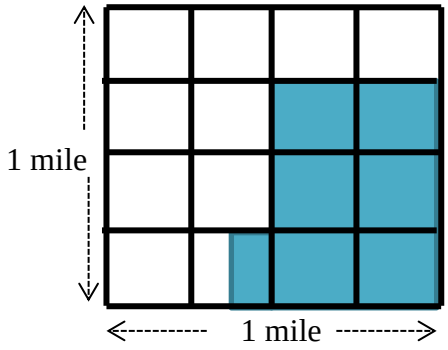
A. 13 B. 14 C. 15

D. 16 E. 17

25. In Fairbanks Alaska, the number of hours of daylight increases rapidly each February. On February 1, sunrise was at 9:37 AM and sunset was at 4:33 pm. On February 28, sunrise was at 8:02 AM and sunset was at 6:08 pm. How many more minutes of daylight were there on February 28 than on February 1?

A. 166 B. 172 C. 178 D. 184 E. 190

26. In the 19th Century, surveyors divided Missouri into 1 mile by 1 mile squares. Each square mile contained 640 acres of land. Each square mile was further divided into 16 equal-sized smaller squares. If Mr. Moses Austin owned the land that is shaded, how many acres of land did Moses Austin own?



A. 200 B. 220 C. 240

D. 260 E. 280

27. Cheryl averaged 82 on her six 100-point math tests. If she averaged 70 on her first two tests, what did she average on her last four tests?

A. 88 B. 90 C. 92 D. 94 E. 96

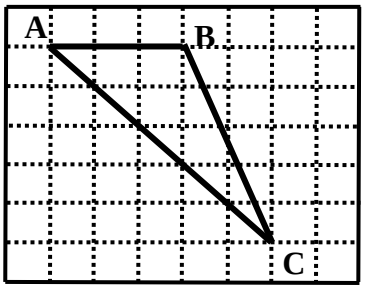
28. Example: If Lou wins a race in 15 minutes and I finish 3 minutes behind Lou, then I finished 3/15 or 1/5 or 20 *percent behind the winner*. In the 2013 World Ski Orienteering Championship in Kazakhstan, Anastasia Kravchenko won in 53 minutes, 37 seconds. Alison Crocker of the USA finished in 12th in 59 minutes, 27 seconds. Alison was what percent behind the winner? Round to the nearest tenth of a percent.

A. 9.8% B. 9.9% C. 10.0% D. 10.9% E. 11.1%

29. A Wallymart parking lot has space for 1200 cars. 15% of the spaces are reserved for compact cars. On Tuesday evening, the lot was $\frac{3}{4}$ full. 760 of the parked cars were not in the spaces reserved for compact cars. How many spaces reserved for compact cars were still available?

A. 10 B. 30 C. 20 D. 40 E. 50

30. This grid is divided into 1 cm by 1 cm squares.
In square centimeters, what is the area of triangle ABC?



A. 7 B. 7.25 C. 7.5

D. 7.75 E. 8

31. What is the positive difference between the area of a square with perimeter 120 m and the area of a rectangle with perimeter 120 m if the length of the rectangle is three times its width?

A. 0 m^2 B. 100 m^2 C. 225 m^2 D. 400 m^2 E. 900 m^2

32. Along the Mississippi River, the distance from Hannibal, Missouri, to the Gulf of Mexico is about 1500 miles. To estimate the speed of his raft, Tom Sawyer measures that it drifts 65 feet in 20 seconds. If this rate stays constant and Tom drifts 12 hours each day, which is the best estimate of the number of days it would take Tom to drift from Hannibal to the Gulf of Mexico? (1 mile = 5280 feet)

A. 28 B. 56 C. 96 D. 112 E. 192

33. How many zeroes are at the end of the product of *15 billion times 12 million*?

A. 10 B. 12 C. 13 D. 15 E. 16

34. In January, Rick and Fran drove 680 miles on I-55 from St. Louis to New Orleans. Along the way, in order, they passed Cape Girardeau MO, Memphis TN, and Jackson MS. It is 115 miles from St. Louis to Cape Girardeau; 380 miles from Cape Girardeau to Jackson; and 395 miles from Memphis to New Orleans.
How far is it from Cape Girardeau to Memphis?

A. 165 miles B. 170 miles C. 180 miles D. 185 miles E. 210 miles

35. A stack of 5 quarters is 1 cm tall. A stack of 4 dimes is the same height as a stack of 3 quarters.
What is the total value of a 20 cm stack of quarters and a 30 cm stack of dimes?

A. $45.00 B. $48.00 C. $50.50 D. $54.40 E. $60.50

36. If 12 woodchucks could chuck 6 cords of wood in 4 hours, in one hour *how much wood could a woodchuck chuck if a woodchuck could chuck wood*?

A. 1/8 cord B. 1/4 cord C. 1/2 cord D. 3/4 cord E. 1 cord

37. How many 4-digit numbers are there with four different digits and with a thousand's digit two larger than its unit's digit? (For example, 7405 is one such number.)

A. 336 B. 448 C. 504 D. 720 E. 2688

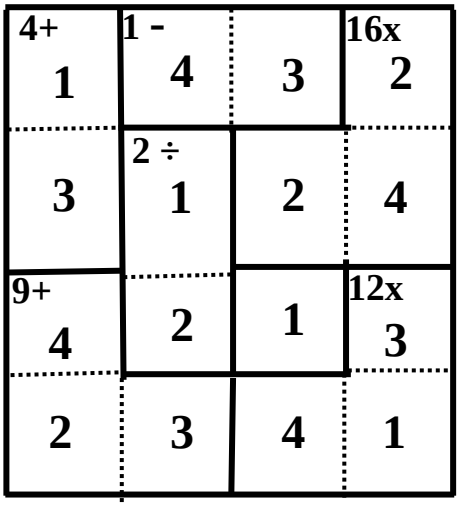
38. In November, 2013, Rick's daughter Zan will be one billion seconds old. In what year was she born?

A. 1976 B. 1979 C. 1982 D. 1985 E. 1987

In Problems #39 and #40, you need to complete two *Ken-Ken Puzzles.*
RULES: In any correctly completed 4x4 *Ken-Ken Puzzle*:

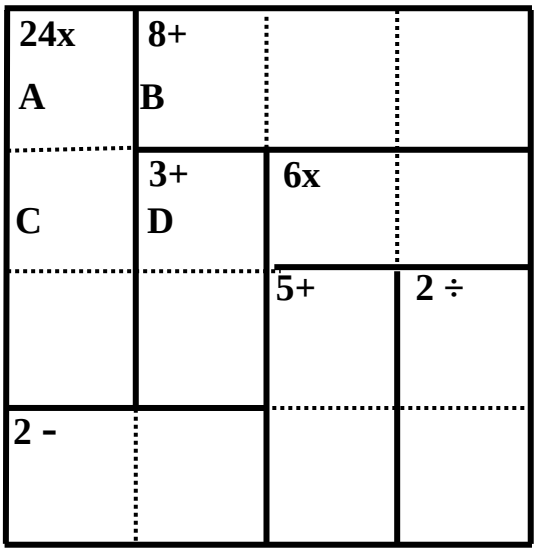
- Use only the numbers 1, 2, 3, 4
- Each row must contain 1, 2, 3, 4
- Each column must contain 1, 2, 3, 4
- Also, the numbers in each region with a **heavy border** must make the calculation true. For example:
  - **2 ÷** means that the quotient of the two numbers must be **2**
  - **1 -** means that the difference of the two numbers must be **1**
  - **12x** means that the product of the two or more numbers must be **12**
  - **9+** means that the sum of the two or more numbers must be **9**

SAMPLE →



A correctly completed puzzle is to the right.

39. Using only ***1, 2, 3,*** and ***4,*** complete this 4x4 *Ken-Ken Puzzle*.

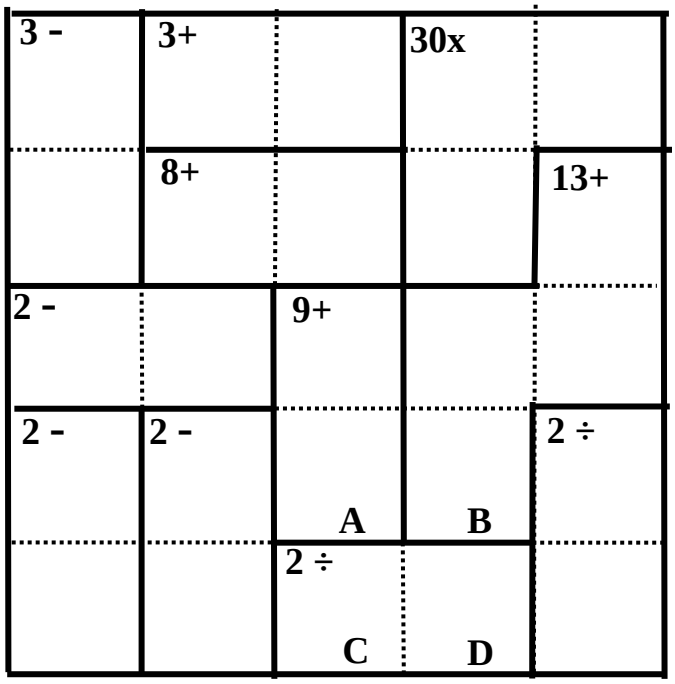


What is the sum of the four numbers in the boxes labeled A, B, C, and D?

A. 8 B. 9 C. 10

D. 11 E. 12

40. Using only ***1, 2, 3, 4***, and ***5***, complete this 5x5 *Ken-Ken Puzzle*.



What is the sum of the four numbers in the four boxes labeled A, B, C, and D?

A. 13 B. 14

C. 15 D. 16

E. 17