

Sixth Grade Test - Excellence in Mathematics Contest – 2012

1. Tanya has \$3.40 in nickels, dimes, and quarters.
If she has seven quarters and four dimes, how many nickels does she have?
A. 21 B. 22 C. 23 D. 24 E. 25
2. How many seconds are in 2.4 minutes?
A. 124 B. 140 C. 144 D. 148 E. 160
3. Maggie read a book in five days, Monday through Friday. Each day, she read 12 more pages than the previous day. She read 47 pages on Thursday. How many pages were in the book?
A. 59 B. 116 C. 140 D. 175 E. 235
4. How many thousands are in the number: *56 million and 200 thousand* ?
A. 562 B. 5,620 C. 56,200 D. 562,000 E. 56,200,000
5. A number multiplied by 12 is 96. What is the answer when that number is multiplied by two-thirds of 27?
A. 72 B. 144 C. 216 D. 20,736 E. 10,368
6. **1 2 3 4 5 7 8 9**
Using these eight digits (each once), write any two 3-digit numbers and one 2-digit number. Add those three numbers. What is the remainder when that sum is divided by 9?
A. 0 B. 1 C. 2 D. 3 E. 6
7. The New York Giants won Super Bowl XLVI on Sunday, February 5, 2012. Which Super Bowl was this?
A. 44th B. 46th C. 56th D. 94th E. 96th
8. $\frac{2}{5}$ of a class of 30 students were girls. Then two girls joined the class and eight boys left the class. What fraction of the class do girls now represent?
A. $\frac{1}{2}$ B. $\frac{2}{3}$ C. $\frac{7}{5}$ D. $\frac{7}{15}$ E. $\frac{7}{12}$
9. There are two pints in a quart and four quarts in a gallon. During one lunch period a cafeteria serves 700 half-pints of milk. How many gallons of milk is that?
A. 43.3 B. 43.75 C. 44 D. 87.25 E. 87.5
10. Jan buys a toy that was discounted 20%. If this saved her \$15, what was the original price of the toy?
A. \$3 B. \$18 C. \$60 D. \$75 E. \$90

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11. Which number is the greatest of the following five numbers?

- A. $\frac{172}{125}$ B. $1\frac{3}{8}$ C. 1.37 D. 1.1^3 E. 1.3718

12. From this array of sixteen numbers, select any four numbers such that you have selected exactly one number from each row and exactly one number from each column.

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

What is the sum of your four numbers?

- A. 28 B. 30 C. 32 D. 34 E. 36

13. The area of one face of a cube is 9 square centimeters. What is the volume of the cube?

- A. 27 cm^3 B. 36 cm^3 C. 54 cm^3 D. 81 cm^3 E. 729 cm^3

14. Which one of these five numbers is a prime number?

- A. 51 B. 91 C. 101 D. 111 E. 121

15. $\frac{-4+12 \div 4 - 16}{8 - 2}$ equals

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

16. When you multiply five million times four billion the answer is “2” followed by how many zeroes?

- A. 12 B. 13 C. 15 D. 16 E. 18

17. For how many natural numbers N is $\frac{N}{60}$ greater than $\frac{1}{4}$ AND less than $\frac{2}{3}$?

- A. 24 B. 25 C. 26 D. 30 E. 32

18. The average of five different positive odd numbers is 15.
What is the largest possible value of any one of these five numbers?

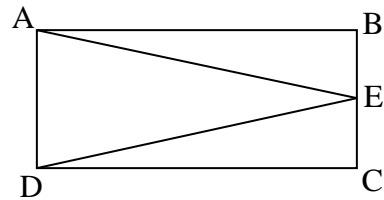
- A. 19 B. 27 C. 39 D. 59 E. 71

19. A 9.0 earthquake and resulting tsunami struck Japan at approximately 3 PM on Friday, March 11, 2011.
About 211 hours later, 80-year old Sumi Abe and her 16-year old grandson Jin Abe were found alive in the damaged kitchen of their collapsed house. When were they found?

- A. 10 AM on Saturday, March 19 B. 11 PM on Saturday, March 19
C. 10 AM on Sunday, March 20 D. 11 PM on Sunday, March 20
E. 8 PM on Saturday, March 19

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20. One side of square A is five times the length of one side of square B.
How many times greater is the area of square A than the area of square B?
- A. 5 B. 10 C. 15 D. 20 E. 25
21. How many of these five numbers have exactly six positive factors? **12 ; 18 ; 24 ; 32 ; 50**
(Note: A number IS considered a factor of itself. For example, 17 has exactly two factors: 1 and 17.)
- A. 1 B. 2 C. 3 D. 4 E. 5
22. The sum of four numbers is 1473.23. The average of three of the numbers is 438.8.
What is the fourth number?
- A. 156.83 B. 157.19 C. 344.81 D. 368.3075 E. 1034.43
23. In basketball, a player can score by making 2-point shots, 3-point shots, or 1 point for each free throw made.
In one game, Loni made four of seven 2-point shots, two of five 3-point shots, and attempted 16 free throws.
If she scored 24 points, what percent of her free throws did she make?
- A. 37.5% B. 50% C. 60% D. 62.5% E. $66\frac{2}{3}\%$
24. Several rectangles with a perimeter of 14 inches have widths and lengths that are a natural number of inches.
How many different areas are possible for these rectangles?
- A. 1 B. 2 C. 3 D. 4 E. 6
25. On a 5 cm by 5 cm grid of 1 cm by 1 cm squares, every other square including the four corner squares are shaded grey.
What percent of this 5 cm by 5 cm grid is NOT shaded grey?
- A. 48% B. 50% C. 51% D. 52% E. 60%
26. If the perimeter of rectangle ABCD is 160 inches and CD = 48 inches, what is the area of triangle AED?
- A. 640 in^2 B. 704 in^2 C. 768 in^2
D. 840 in^2 E. 2688 in^2



27. A pizza is cut into N identical slices. Philippe eats the last four slices which was $\frac{2}{5}$ of the pizza. What is N?

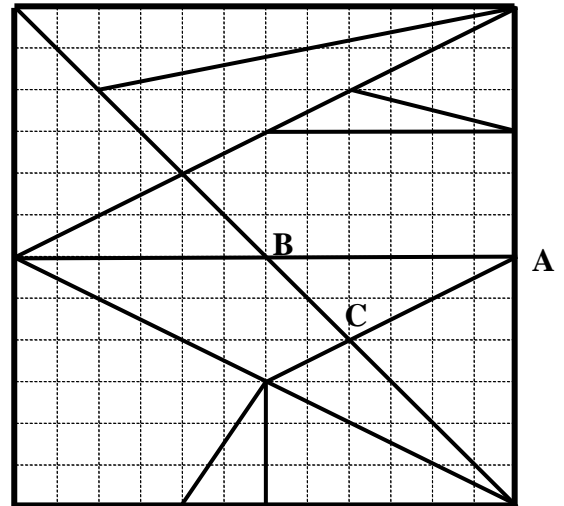
A. 10 B. 12 C. 15 D. 16 E. 20

28. What is the ratio of the number of degrees in the interior angle of an equilateral triangle to the number of degrees in the interior angle of a square?

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

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About 2500 years ago the Greek mathematician Archimedes studied the geometry of a game called Stomachion. The game consisted of 14 polygonal pieces that fit together to form a 12 by 12 square grid (see the diagram). The 14 pieces do not overlap and every vertex of each shape lies exactly on a lattice point of this grid.



29. What is the area of triangle ABC?

- A. 5.5 square units B. 6 square units
- C. 6.5 square units D. 10 square units
- E. 12 square units

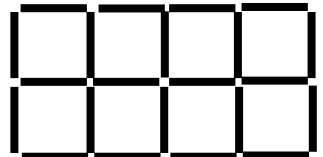
30. Of the 14 non-overlapping polygons that form the Stomachion diagram, how many are triangles?

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

31. Jui Chin put \$10 into savings on January 1, \$20 on February 1, \$30 on March 1, and so on. Each month he saved \$10 more than the previous month.
 Mui Tze put \$1 into savings on January 1, \$2 on February 1, \$4 on March 1, and so on. Each month she saved twice as much as the previous month.
 At the end of one year, how much more had Mui Tze saved than Jui Chin?

- A. \$1268 B. \$3315 C. \$3435 D. \$7410 E. \$7411

32. Twenty-two rods of equal length are needed to build this 2 by 4 array of 8 small squares. How many rods would be needed to construct a 2 by 40 array of 80 small squares?



- A. 200 B. 202 C. 206 D. 216 E. 220

33. There are 4 red marbles, 5 blue marbles, 6 green marbles, and 7 yellow marbles in a bag. Without looking, what is the minimum number of marbles that must be drawn from the bag to be absolutely sure that at least three of the balls drawn are the same color?

- A. 9 B. 10 C. 12 D. 18 E. 21

34. A bicyclist climbs a 10-mile mountain road at an average rate of 8 miles per hour and then descends the same 10-mile route at an average rate of 30 mph. What is his average speed in miles per hour for this 20-mile ride? Round to one decimal place.

- A. 12.6 B. 13.5 C. 16.2 D. 17.0 E. 19.0

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35. To swim 800 m in her family’s rectangular pool, Fran could swim the length 50 times or she could swim the perimeter of the pool 16 times. In square meters, what is the area of the pool?

- A. 144 B. 196 C. 400 D. 544 E. 800

36. Three men start work at 6:00 AM to dig two holes. Assume that each worker digs at the same rate. One of them works alone and finishes digging a 3 foot by 3 foot by 3 foot hole at 8:00 AM. The other two men work together to dig a 6 foot by 6 foot by 6 foot hole. At what time will these two men finish?

- A. 8:00 AM B. 10:00 AM C. 2:00 PM D. 4:00 PM E. 10:00 PM

37. A 200 ml mixture is 80% water and 20% bleach. How much water must be added to dilute the mixture to 5% bleach?

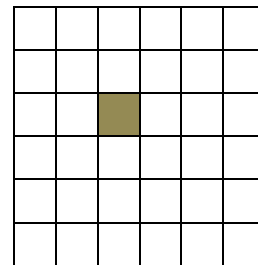
- A. 160 ml B. 300 ml C. 320 ml D. 600 ml E. 640 ml

38. The product of the digits of many 4-digit numbers is 96. What is the sum of the greatest and the least such 4-digit numbers?

- A. 9779 B. 9889 C. 9999 D. 10,550 E. 10,560

39. In this 6 by 6 grid of squares, there are squares in size from 1 by 1 to 6 by 6. Using the grid lines, what is the total number of squares (of all sizes) which **include** the shaded square?

- A. 18 B. 20 C. 26
D. 28 E. 91



40. Complete this 4 by 4 grid so that the numbers 1, 2, 3, and 4 occur in every row and in every column. In addition the three greater than and less than symbols indicate which of the two adjacent numbers is larger or smaller.

What is the sequence of numbers in the SECOND row (from the top)?

- A. 2341 B. 3421 C. 3241
D. 4231 E. 4321

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