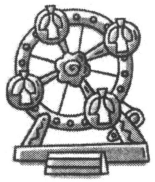
M8 Class 8 Test 1

1. Susan had \$50 to spend at the carnival. She spent \$12 on food and twice as much on rides. How many dollars did she have left to spend?



(A) 12 **(B)** 14 **(C)** 26 **(D)** 38 **(E)** 50

2. The ten-letter code BEST OF LUCK represents the ten digits 0–9, in order. What 4-digit number is represented by the code word CLUE?

(A) 8671 **(B)** 8672 **(C)** 9781 **(D)** 9782 **(E)** 9872

3. If February is a month that contains Friday the 13^{th}, what day of the week is February 1 ?

(A) Sunday **(B)** Monday **(C)** Wednesday **(D)** Thursday **(E)** Saturday

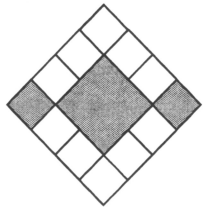
4. In the figure, the outer equilateral triangle has area 16, the inner equilateral triangle has area 1, and the three trapezoids are congruent. What is the area of one of the trapezoids?

(A) 3 **(B)** 4 **(C)** 5 **(D)** 6 **(E)** 7

5. Barney Schwinn notices that the odometer on his bicycle reads 1441, a palindrome, because it reads the same forward and backward. After riding 4 more hours that day and 6 the next, he notices that the odometer shows another palindrome, 1661. What was his average speed in miles per hour?

(A) 15 **(B)** 16 **(C)** 18 **(D)** 20 **(E)** 22

6. In the figure, what is the ratio of the area of the gray squares to the area of the white squares?

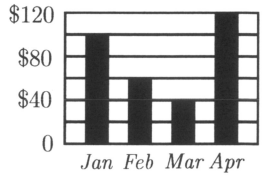


(A) 3 : 10 **(B)** 3 : 8 **(C)** 3 : 7 **(D)** 3 : 5 **(E)** 1 : 1

7. If $\frac{3}{5} = \frac{M}{45} = \frac{60}{N}$, what is $M + N$?

(A) 27 **(B)** 29 **(C)** 45 **(D)** 105 **(E)** 127

8. Candy sales of the Boosters Club for January through April are shown. What were the average sales per month in dollars?



(A) 60 **(B)** 70 **(C)** 75 **(D)** 80 **(E)** 85

9. In 2005 Tycoon Tammy invested \$100 for two years. During the first year her investment suffered a 15% loss, but during the second year the remaining investment showed a 20% gain. Over the two-year period, what was the change in Tammy's investment?

(A) 5% loss **(B)** 2% loss **(C)** 1% gain **(D)** 2% gain **(E)** 5% gain

10. The average age of the 6 people in Room A is 40. The average age of the 4 people in Room B is 25. If the two groups are combined, what is the average age of all the people?

(A) 32.5 **(B)** 33 **(C)** 33.5 **(D)** 34 **(E)** 35

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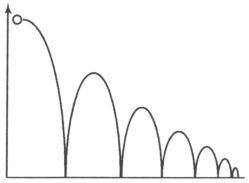
11. Each of the 39 students in the eighth grade at Lincoln Middle School has one dog or one cat or both a dog and a cat. Twenty students have a dog and 26 students have a cat. How many students have both a dog and a cat?

(A) 7 **(B)** 13 **(C)** 19 **(D)** 39 **(E)** 46

12. A ball is dropped from a height of 3 meters. On its first bounce it rises to a height of 2 meters. It keeps falling and bouncing to $\frac{2}{3}$ of the height it reached in the previous bounce. On which bounce will it not rise to a height of 0.5 meters?

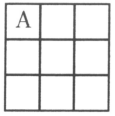


(A) 3 **(B)** 4 **(C)** 5 **(D)** 6 **(E)** 7

13. Mr. Harman needs to know the combined weight in pounds of three boxes he wants to mail. However, the only available scale is not accurate for weights less than 100 pounds or more than 150 pounds. So the boxes are weighed in pairs in every possible way. The results are 122, 125 and 127 pounds. What is the combined weight in pounds of the three boxes?

(A) 160 **(B)** 170 **(C)** 187 **(D)** 195 **(E)** 354

14. Three As, three Bs and three Cs are placed in the nine spaces so that each row and column contain one of each letter. If A is placed in the upper left corner, how many arrangements are possible?

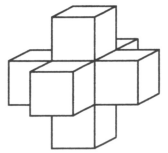


(A) 2 **(B)** 3 **(C)** 4 **(D)** 5 **(E)** 6

15. In Theresa's first 8 basketball games, she scored 7, 4, 3, 6, 8, 3, 1 and 5 points. In her ninth game, she scored fewer than 10 points and her points-per-game average for the nine games was an integer. Similarly in her tenth game, she scored fewer than 10 points and her points-per-game average for the 10 games was also an integer. What is the product of the number of points she scored in the ninth and tenth games?

(A) 35 **(B)** 40 **(C)** 48 **(D)** 56 **(E)** 72

16. A shape is created by joining seven unit cubes, as shown. What is the ratio of the volume in cubic units to the surface area in square units?

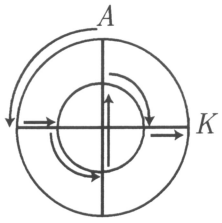


(A) 1 : 6 **(B)** 7 : 36 **(C)** 1 : 5 **(D)** 7 : 30 **(E)** 6 : 25

17. Ms. Osborne asks each student in her class to draw a rectangle with integer side lengths and a perimeter of 50 units. All of her students calculate the area of the rectangle they draw. What is the difference between the largest and smallest possible areas of the rectangles?

(A) 76 **(B)** 120 **(C)** 128 **(D)** 132 **(E)** 136

18. Two circles that share the same center have radii 10 meters and 20 meters. An aardvark runs along the path shown, starting at A and ending at K. How many meters does the aardvark run?



(A) $10\pi + 20$ **(B)** $10\pi + 30$ **(C)** $10\pi + 40$ **(D)** $20\pi + 20$ **(E)** $20\pi + 40$

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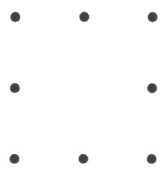
19. Eight points are spaced at intervals of one unit around a 2×2 square, as shown. Two of the 8 points are chosen at random. What is the probability that the points are one unit apart?

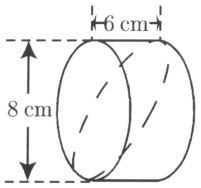


(A) $\frac{1}{4}$ **(B)** $\frac{2}{7}$ **(C)** $\frac{4}{11}$ **(D)** $\frac{1}{2}$ **(E)** $\frac{4}{7}$

20. The students in Mr. Neatkin's class took a penmanship test. Two-thirds of the boys and $\frac{3}{4}$ of the girls passed the test, and an equal number of boys and girls passed the test. What is the minimum possible number of students in the class?

(A) 12 **(B)** 17 **(C)** 24 **(D)** 27 **(E)** 36

21. Jerry cuts a wedge from a 6-cm cylinder of bologna as shown by the dashed curve. Which answer choice is closest to the volume of his wedge in cubic centimeters?

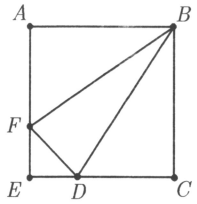


(A) 48 **(B)** 75 **(C)** 151 **(D)** 192 **(E)** 603

22. For how many positive integer values of n are both $\frac{n}{3}$ and $3n$ three-digit whole numbers?

(A) 12 **(B)** 21 **(C)** 27 **(D)** 33 **(E)** 34

23. In square $ABCE$, $AF = 2FE$ and $CD = 2DE$. What is the ratio of the area of $\triangle BFD$ to the area of square $ABCE$?



(A) $\frac{1}{6}$ **(B)** $\frac{2}{9}$ **(C)** $\frac{5}{18}$ **(D)** $\frac{1}{3}$ **(E)** $\frac{7}{20}$

24. Ten tiles numbered 1 through 10 are turned face down. One tile is turned up at random, and a die is rolled. What is the probability that the product of the numbers on the tile and the die will be a square?

(A) $\frac{1}{10}$ **(B)** $\frac{1}{6}$ **(C)** $\frac{11}{60}$ **(D)** $\frac{1}{5}$ **(E)** $\frac{7}{30}$

25. Margie's winning art design is shown. The smallest circle has radius 2 inches, with each successive circle's radius increasing by 2 inches. Approximately what percent of the design is black?

(A) 42 **(B)** 44 **(C)** 45 **(D)** 46 **(E)** 48