3 POINTS FOR EACH PROBLEM

1. What is halfway between 2006 and 6002?

A) 3998 B) 4000 C) 4002 D) 4004 E) 4006

2. How many four-digit numbers (with all different digits) are divisible by 2006?

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

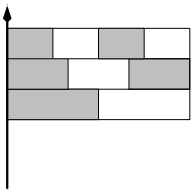
3. What is the smallest 10-digit number that can be obtained by putting together the following six numbers one after another: 309, 41, 5, 7, 68, and 2?

A) 1 234 567 890 B) 1 023 456 789 C) 3 097 568 241 D) 2 309 415 687 E) 2 309 416 857

4. How many times between 00:00 and 23:59 does an electronic watch show all of the following four digits: 2, 0, 0 and 6 in any order?

A) 2 B) 4 C) 5 D) 6 E) 12

5. A flag consists of three stripes of equal width, which are divided into two, three and four equal parts, respectively. What fraction of the flag's area is shaded?



A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{3}{5}$ D) $\frac{4}{7}$ E) $\frac{5}{9}$

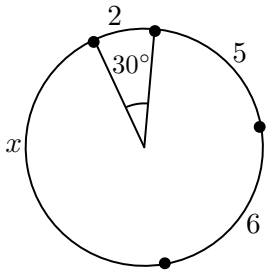
6. My Grandma's watch is running fast one minute per hour and my Grandpa's watch is running slow one minute per hour. When I left their house, I synchronized their watches and told them I would return when the difference between the times on their watches is exactly one hour. After how many hours will I go back to my grandparent's house?

A) 12 h. B) 14 h 30 min. C) 30 h. D) 60 h. E) 90 h.

7. Jack says that 25% of his books are novels, and 1/9 of them are poetry. How many books does Jack have since we know he has between 50 and 100 books?

A) 50 B) 56 C) 64 D) 72 E) 93

8. A circle is divided into four arcs of length 2, 5, 6 and x. Arc 2 has a measure of 30°. Find the value of arc x.



A) 7 B) 8 C) 9 D) 10 E) 11

9. Each letter represents a different digit, and each digit a different letter. What digit does G represent?

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

$$\begin{array}{rcccc} & K & A & N \\ & K & A & G \\ + & K & N & G \\ \hline 2 & 0 & 0 & 6 \end{array}$$

10. With how many zeros does the product of the first consecutive 10 prime numbers end?

A) 0 B) 1 C) 2 D) 3 E) 4

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4 POINTS FOR EACH PROBLEM

11. Positive numbers a, b, c, d, and e have the following property: $ab = 2$, $bc = 3$, $cd = 4$, $de = 5$. What is the value of $\frac{e}{a}$?

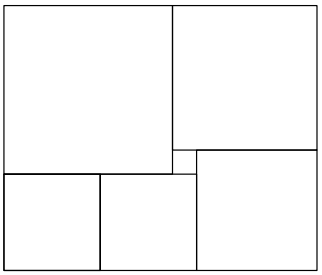
A) $\frac{15}{8}$ B) $\frac{5}{6}$ C) $\frac{3}{2}$ D) $\frac{4}{5}$ E) Impossible to determine.

12. An indiscreet neighbor asked Mrs. Novak how old she was. Mrs. Novak replied, "If I live to be one hundred, then my age is two thirds of the time I have left." How old is Mrs. Novak?

A) 20 B) 40 C) 50 D) 60 E) 80

13. The rectangle in the picture is divided into six squares. The length of the sides of the smallest square is 1. What is the length of the sides of the largest square?

A) 4 B) 5 C) 6 D) 7 E) 8



14. A box of chocolate costs \$10.00. There is a coupon in each of the chocolate boxes. For three coupons, you can get an additional box of chocolate free. What is the greatest number of boxes of chocolate you can get for \$150.00?

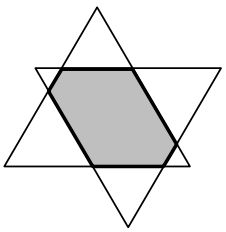
A) 15 B) 17 C) 20 D) 21 E) 22

15. Mr. and Mrs. Dobson have some children. The average age of the Dobson family is 18 years. Without the 38-year-old father, the average age of the family decreases to only 14 years. How many children are there in Dobson's family?

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

16. Two identical equilateral triangles with 18 cm perimeters are overlapping with their respective sides parallel. What is the perimeter of the shaded hexagon?

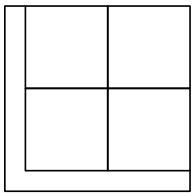
A) 9 cm B) 12 cm C) 13 cm D) 14 cm E) 18 cm



17. What is the maximum number of digits that a number could have if every pair of its consecutive digits is a perfect square?

A) 5 B) 4 C) 3 D) 6 E) 10

18. A square of area 125 cm^2 was divided into five parts of equal area – four squares and one L-shaped figure as shown in the picture. Find the length of the shortest side of the L-shaped figure.

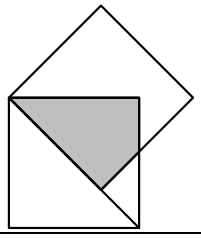


A) 1 cm B) 1,2 cm C) $2(\sqrt{5}-2)$ cm D) $3(\sqrt{5}-1)$ cm E) $5(\sqrt{5}-2)$ cm

19. A box contains 15 balls that are colored red and blue (meaning two colors on one ball), 12 balls that are colored blue and green and 9 balls that are colored green and red. What is the smallest number of balls that must be selected to guarantee that you have at least seven balls that share a color?

A) 7 B) 8 C) 9 D) 10 E) 11

20. Two squares with each side equal to 1 overlap in the way shown in the picture. What is the area of the shaded region?



A) $\sqrt{2}-1$ B) $\frac{\sqrt{2}}{2}$ C) $\frac{\sqrt{2}+1}{2}$ D) $\sqrt{2}+1$ E) $\sqrt{3}-\sqrt{2}$

5 POINTS FOR EACH PROBLEM

21. Each face of a die is colored with one of only two selected colors. How many different 2 colored dice can be made?

A) 64 B) 62 C) 48 D) 36 E) 24

22. A train consists of a locomotive and five wagons: I, II, III, IV and V. How many ways can the wagons be arranged so that wagon I is always closer to the locomotive than wagon II?

A) 120 B) 60 C) 48 D) 30 E) 10

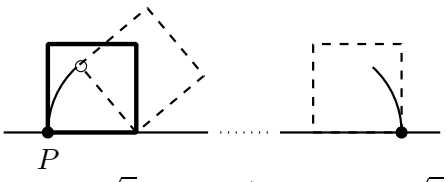
23. x, y and z are positive real numbers. Let $x \geq y \geq z$ and $x+y+z=20$. Which of the statements below are true? (Symbol "$\cdot$" indicates multiplication.)

A) Always $x \cdot y < 99$ B) Always $x \cdot y > 1$ C) Always $x \cdot y \neq 25$ D) Always $x \cdot y \neq 75$
E) None of the above.

24. Numbers 1, 2, and 3 are written on the circumference of a circle. Afterwards, the sum of each pair of neighboring numbers is written between them. In such a way 6 numbers are obtained (1, 3, 2, 5, 3 and 4). This operation of writing sums of two neighboring numbers is repeated three more times, resulting in 48 numbers on the circle. What is the sum of these numbers?

A) 162 B) 1458 C) 486 D) 144 E) 210

25. A square with sides of 10 cm length is rolled without slipping along a line until point P returns to the line. What is the length of the curve that point P has made?



A) 10π B) $5\pi + 5\pi\sqrt{2}$ C) $10\pi + 5\pi\sqrt{2}$ D) $5\pi + 10\pi\sqrt{2}$ E) $10\pi + 10\pi\sqrt{2}$

26. Working on a *Math Kangaroo* problems Barbara noticed that the following conclusions are correct:

1. If answer A is true, then answer B is also true.
2. If answer C is not true, then answer B is also not true.
3. If answer B is not true, then neither D nor E is true.

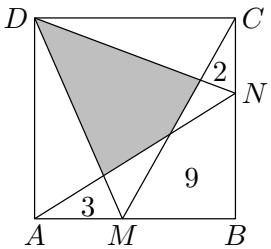
Which answer is correct?

A) A B) B C) C D) D E) E

27. The numbers 257 and 338 have a characteristic that when put in reverse order they create larger numbers 752 and 833. How many 3-digit numbers have this property?

A) 124 B) 252 C) 280 D) 288 E) 360

28. Points M and N are chosen on square $ABCD$. The square is then divided into eight parts with three given areas (see the picture). What is the area of the shaded region?



A) 14 B) 18 C) 11 D) 12 E) 9

29. Number y is defined as a sum of the digits of number x, and z as a sum of the digits of number y. How many natural numbers x satisfy equation: $x + y + z = 60$?

A) 0 B) 1 C) 2 D) 3 E) More than 3.

30. Suppose the final result of a football match is 5-4, the home team winning. If the home team scored first and kept the lead until the end, in how many different orders could the goals have been scored?

A) 17 B) 13 C) 20 D) 14 E) 9